

Water System Planning Handbook

April 1997



Environmental Health Programs
Division of Drinking Water

Water System Planning Handbook

April 1997



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Acronyms/Abbreviations

ACWSP	Abbreviated Coordinated Water System Plan
APWA	American Public Works Association
AWWA	American Waterworks Association
BMPs	Best Management Practices
CCC	Cross-Connection Control
CWSP	Coordinated Water System Plan
CWSSA	Critical Water Supply Service Area
DNS	Determination of Non-Significance
DOH	State Department of Health
Ecology	State Department of Ecology
ERU	Equivalent Residential Unit
EIS	Environmental Impact Statement
FVT	Financial Viability Test
GMA	Growth Management Act
GWU	Ground Water Under the Influence of Surface Water
IOU	Investor Owned Utility
LID	Local Improvement District
MCL	Maximum Contaminant Level
NTNC	Nontransient Noncommunity Water System
PE	Professional Engineer
PSI	Pounds Per Square Inch
OFM	State Office of Financial Management
RCW	Revised Code of Washington
SAL	State Advisory Level
SDWA	Federal Safe Drinking Water Act
SEPA	State Environmental Policy Act
SOC	Synthetic Organic Chemical
SWTR	Surface Water Treatment Rule
TNC	Transient Noncommunity Water System
UGA	Urban Growth Area

UTC	State Utilities and Transportation Commission
VOC	Volatile Organic Chemical
WAC	Washington Administrative Code
WFI	Water Facilities Inventory Form
WHPA	Wellhead Protection Area
WRIA	Water Resources Inventory Area
WSP	Water System Plan

Definitions

Some of the following definitions are rules, others are from other sources. These definitions should assist in preparing a water system plan. Additional definitions can be found in WAC 246-290-010, WAC 246-290-610, WAC 246-293-110 and other DOH rules.

"Authorized agent " means any person who:

- Makes decisions regarding the operation and management of a public water system whether or not he or she is engaged in the physical operation of the system;
- Makes decisions whether to improve, expand, purchase, or sell the system; or
- Has discretion over the finances of the system.

"Category red operating permit " means an operating permit identified as such pursuant to Chapter 246-294 WAC. Placement in this category results in permit issuance with conditions and a determination that the system is inadequate.

"Comprehensive monitoring plan " means a schedule which describes both the frequency and appropriate locations for sampling of drinking water contaminants as required by state and federal rules.

"Comprehensive system evaluation " means a review, inspection and assessment of a public water system, including, but not limited to: source; facilities; equipment; operation and administration; maintenance; records; planning documents and schedules; and monitoring, for the purpose of ensuring that safe and adequate drinking water is provided.

"Conservation plan " means the development and implementation of a cost effective water conservation program, development of water demand forecasts, and collection of water use data.

"Conservation program" means policies and activities implemented to encourage or cause efficient use of water on a long-term basis. Conservation programs must include identification of the conservation objectives of the system, evaluation of conservation measures required to be considered, and identification of specific conservation measures for implementation.

"Contingency plan " means that portion of the wellhead protection program section of the water system plan or small water system management program which addresses the replacement of the major well(s) or wellfield in the event of loss due to ground water contamination.

"Coordinated water system plan " means a plan for public water systems within a critical water supply service area which identifies the present and future water system concerns and sets forth a means for meeting those concerns in the most efficient manner possible.

"Critical water supply service area" means a geographical area designated by the department or county legislative authority characterized by public water system problems related to inadequate water quality, unreliable service, and/or lack of coordinated water system planning. It may be further characterized by a proliferation of small, inadequate public water systems, or by water supply problems which threaten the present or future water quality or reliability of service in such a manner that efficient and orderly development may best be achieved through coordinated planning by public water systems in the area.

"Cross-connection " means a physical arrangement connecting a public water system, directly or indirectly, with anything other than another potable water system, and capable of contaminating the public water system.

"Curtailment" means short term, infrequent actions by a utility and its customers to reduce their water use during or in anticipation of a water shortage.

"Demand forecast" means an estimate of future municipal water use assuming average weather conditions and calculated using numerous parameters, including population, historic water use, local land use plans, water rates and their impacts on consumption, employment of a conservation program. Demand forecasts are used to plan for new water supply sources and facility expansions.

"Department" means the Washington State Department of Health or health officer as identified in a joint plan of operation in accordance with WAC 246-290-030(1).

"Existing service area" means a specific area within which direct service or retail service connections to customers of a public water system are currently available.

"Expanding public water system" means a public water system installing additions, extensions, changes, or alterations to their existing source, transmission, storage, or distribution facilities which will enable the system increasing in size its existing service area and/or its number of approved service connections. Exceptions:

A system which connects new approved individual retail or direct service connections onto an existing distribution system within an existing service area; or

A distribution system extension in an existing service area identified in a current and approved water system plan or project report.

"Fire flow" means the rate of water flow needed to fight fires under WAC 246-293-640 or adopted city, town, or county standards.

"Future service area" means a specific area for which water service is planned by a public water system, as identified in a water system plan.

"Ground water under the direct influence of surface water" means any water beneath the surface of the ground, which the department determines has the following characteristics:

Significant occurrence of insects or other macroorganisms, algae, or large-diameter pathogens such as *Giardia lamblia*; or

Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH closely correlating to climatological or surface water conditions.

"Guideline" means a department document assisting the purveyor in meeting a rule requirement.

"Health officer" means the health officer of the city, county, city-county health department or district, or an authorized representative.

"Hydraulic analysis" means the study of the water system network evaluating water flows within the distribution system under worst case conditions such as, peak hourly design flow plus fire flow, when required. Hydraulic analysis includes consideration of all factors affecting system energy losses.

"Initial inventory" means an inventory which consists, at a minimum, of all potential sources of ground water contamination located within the one year time of travel area of a WHPA and all high risk potential sources of ground water contamination located within the ten year ground water time of travel area.

"Maximum contaminant level" means the maximum permissible level of a contaminant in water the purveyor delivers to any public water system user, measured at the locations identified under WAC 246-290-300, Table 4.

"Municipal water use" means the amount of water delivered for use by public water systems.

"Nonacute" means posing a possible or less than immediate risk to human health.

"Population served" means the number of persons, resident and nonresident, having immediate access to drinking water from a public water system, whether or not such persons have actually

consumed water from that system. The number of nonresidents shall be the average number of persons having immediate access to drinking water on days access was provided during that month. In the absence of specific population data, the number of residents shall be computed by multiplying the number of active services by two and one-half.

"Potable" means water suitable for drinking by the public.

"Primary standards " means standards based on chronic, nonacute, or acute human health effects.

"Protected ground water source " means a ground water source the purveyor shows to the department's satisfaction as protected from potential sources of contamination on the basis of hydrogeologic data and/or satisfactory water quality history.

"Public water system " is defined and referenced under WAC 246-290-020.

"Purchased source " means water a purveyor purchases from a public water system not under the control of the purveyor for distribution to the purveyor's customers.

"Purveyor " means an agency, subdivision of the state, municipal corporation, firm, company, mutual or cooperative association, institution, partnership, or person or other entity owning or operating a public water system. Purveyor also means the authorized agents of such entities.

"Resident " means an individual living in a dwelling unit served by a public water system.

"Same farm " means a parcel of land or series of parcels which are connected by covenants and devoted to the production of livestock or agricultural commodities for commercial purposes and does not qualify as a Group A public water system.

"Seasonal source " means a public water system source used on a regular basis, but not in use more than three consecutive months within a twelve-month period.

"Secondary standards " means standards based on factors other than health effects.

"Service " means a connection to a public water system designed to provide potable water to a single family residence, or other residential or non-residential population. When the connection is to a system without clearly defined single family residences or with a nonresident population, the following formulas shall be used in determining equivalent number of services:

For group home or barracks-type accommodation, divide the average population served each day by two and one-half;

For NTNC systems, divide the average population served each day by two and one-half;

For TNC systems, divide the average population served each day by twenty-five.

In no case shall the calculated number of services be less than one.

"Source reliability" means a measure of water source's ability to meet specified actual or forecasted water use consistent with it's water right conditions.

"State advisory level " means a department-established value for a contaminant without an existing state board of health MCL. The SAL represents a level which when exceeded, indicates the need for further assessment to determine if the chemical is an actual or potential threat to human health.

"State Board of Health " and **"Board "** means the board created by RCW 43.20.030.

"Surface water " means a body of water open to the atmosphere and subject to surface runoff.

"Susceptibility assessment" means the Susceptibility Assessment Survey Form developed by the department to evaluate the hydrologic setting of the water source and assess its contribution to the sources' overall vulnerability to pollution from surface activities.

"Synthetic organic chemical " means a manufactured carbon-based chemical.

"Time-of-travel" means the time required for ground water to move through the water bearing zone from a specific point to a well.

"Transfer of ownership " means to convey a water system from one person or entity to another. Some actions, such as changes within a corporation or election of new councils or boards, do not constitute a transfer.

"Volatile organic chemical " means a manufactured carbon-based chemical that vaporizes quickly at standard pressure and temperature.

"Water facilities inventory form " means the Department form summarizing each public water system's characteristics.

"Water shortage response plan " means policies and activities (including curtailment) to be implemented to reduce water use on a short-term basis during or in anticipation of a water shortage.

"Water shortage " means a situation during which the supply system cannot meet normal municipal water use and/or water rights conditions. Water shortages can also occur during water supply emergencies such as pipeline failures, but these types of shortages are not considered in assessing source reliability.

"Waterborne disease outbreak " means the significant occurrence of acute infectious illness, epidemiologically associated with drinking water from a public water system, as determined by the appropriate local health agency or the Department.

"Watershed " means the region or area which:

- Ultimately drains into a surface water source diverted for drinking water supply; and
- Affects the physical, chemical, microbiological and radiological quality of the source.

"Well field " means a group of wells one purveyor owns or controls which:

- Draw from the same aquifer or aquifers as determined by comparable inorganic chemical analysis; and
- Discharge water through a common pipe and the common pipe shall allow for collection of a single sample before the first distribution system connection.

"Wellhead protection area " means the portion of a well's, wellfield's or spring's zone of contribution defined as such using WHPA criteria established by the department.

"Yield" means the quantity of water that can be delivered from water sources at a given source reliability and withdrawal and/or demand pattern.

"Zone of contribution " means the area surrounding a pumping well or spring that encompasses all areas or features that supply ground water recharge to the well or spring.

Introduction

Background

Planning is a critical activity for all water utilities. The principal goal of water system planning is to make the best use of available resources in order to provide high quality service and protect the health of utility customers. This is accomplished by making wise decisions about facility and non-facility improvements, operations, and service delivery which are consistent with the utility's overall direction.

The mission of the Department of Health (DOH), Drinking Water Program is to ensure safe and reliable drinking water. DOH looks at the utility's water system plan (WSP) as the foundation, whereby the utility takes a comprehensive look at all of its needs, desires, and statutory requirements and charts a plan of action for achieving those needs, desires, and requirements.

DOH will use the WSP as a means of verifying that water systems comply with the system capacity requirements of the 1996 amendments to the federal Safe Drinking Water Act (SDWA). System capacity is defined as having the technical, managerial, and financial capacity to achieve and remain in compliance with all applicable local, state and federal regulations.

Developing a WSP should help a purveyor:

- Provide a comprehensive evaluation of existing and future system needs for decision makers;
- Provide details of the utility's policies to customers;
- Provide information to help educate customers on utility needs;
- Minimize public health risks for consumers;
- Protect sources of supply;
- Maintain reliable delivery of high quality water;
- Make efficient use of available resources;
- Assist in obtaining new, expanded or modified water rights;
- Help assure orderly growth of the system;
- Provide documentation for utility rates, plus grant and loan requests;
- Develop strategies for complying with the SDWA and other requirements; and
- Develop consistency between the utility's planning efforts, regional CWSPs and local land use plans.

The *Water System Planning Handbook (Planning Handbook)* was written to help utilities prepare WSPs which will comply with all applicable DOH requirements. It aids both the water purveyor and the individual or firm who is preparing a WSP to understand what is required in order to receive approval. It presents an orderly course of action and suggested framework for plan preparation. This handbook is directed at relatively complex Group A community water systems, (i.e. larger systems which typically provide fire flows, have multiple sources, multiple

storage reservoirs, and multiple pressure zones). The level of complexity of the WSP should be commensurate with the level of complexity of the system and the rate of growth occurring within the community. DOH is developing separate guidance for smaller, less complex systems.

Systems Required To Develop WSPs

DOH recommends that all system purveyors prepare a WSP. However, purveyors of the following categories of systems are required to have WSPs approved by DOH, pursuant to WAC 246-290-100 and WAC 246-291-140:

- Systems with 1,000 or more service connections;
- Systems in areas utilizing the Public Water System Coordination Act, Chapter 70.116 RCW and Chapter 246-293 WAC as required in WAC 246-293-230;
- Systems experiencing problems related to planning, water quality, financing, operation and/or management as determined by DOH;
- Any system for which a change of ownership is proposed; and
- Any new or expanding system.

Systems which are not required to prepare a WSP are required to develop a small water system management program pursuant to WAC 246-290-410. Having a water system plan would meet this requirement.

Systems Required To Develop WSP Amendments and Updates

Systems are required to update their WSPs every 6 years. However, more frequent updates may be required within critical water supply service areas (CWSSA).

Many systems, with DOH-approved WSPs, are allowed to install distribution lines and make other distribution improvements without having to submit project reports or construction documents. Please note that during the development of the WSP, all known projects should be identified in the plan. During the implementation period, projects consistent with the intent of the plan, but not specifically identified in the plan, may also be exempt from prior submittal for DOH review. However, a WSP amendment is required, prior to construction of projects, for any project required to have a SEPA analysis, pursuant to WAC 246-03-030(3)(a), including:

- a) all surface water development projects;
- b) any water system storage facilities greater than one-half million gallons;
- c) any new transmission lines longer than 1000 feet and larger than 8 inches in diameter located in new rights of way; and
- d) any major extensions to existing water distribution systems involving use of pipes larger than 8 inches in diameter which are designed to increase the existing service area by more than one square mile.

See Chapter 7, *Distribution Facilities Design and Construction Standards*, for further information regarding construction of distribution projects without submitting a project

report to DOH.

Transfer of Ownership

Transfer of ownership means to convey a water system from one person or entity to another. Some actions, such as changes within a corporation or election of new councils or boards, do not constitute a transfer.

If DOH is notified of a proposed water system sale, DOH shall encourage the utility transferring the system and the prospective new owner to meet with DOH to discuss system status and transfer requirements.

Handbook Organization

The *Planning Handbook* is organized into 10 major chapters. Each chapter represents a basic WSP component. The chapters are:

1. Description of Water System
2. Basic Planning Data and Water Demand Forecasting
3. System Analysis
4. Conservation Program, Water Right Analysis, System Reliability, and Interties
5. Source Water Protection
6. Operation and Maintenance Program
7. Distribution Facilities Design and Construction Standards
8. Improvement Program
9. Financial Program
10. Miscellaneous Documents

Each chapter begins with the **Objective** (why the subject needs to be addressed), followed by the **Plan Content**, (provides details regarding specific requirements for the WSP).

Some chapters contain more detail than others. For planning elements where there are separate guidance documents available, less detail is provided in the *Planning Handbook*. Conversely, if DOH does not have separate guidance on a subject, more extensive guidance is provided here.

A checklist is provided in Appendix II. A copy of the completed checklist should be submitted with the WSP.

Use of Acronyms and Abbreviations

Acronyms and abbreviations are used liberally throughout the *Planning Handbook*. A list is provided for your information, (see pages i and ii).

PE Requirements

WSPs must be prepared under the direction, and bear the seal and signature of a professional engineer, licensed in the state of Washington under Chapter 18.43 RCW and having specific expertise regarding design, operation and maintenance of public water systems.

DOH encourages consulting firms to use experts from planning, finance and other related disciplines, to the extent feasible, to assist in preparing the water system plan. Further, DOH

encourages the utilities, themselves, to help provide information necessary for development of the WSP. By maximizing use of the utility's own expertise along with qualified individuals from related disciplines, the utility may benefit by: (1) reduced cost of WSP development, and (2) end up with a better plan.

Getting Started

Before writing the WSP, it is important that decision makers consider several key policies and system requirements. Early consideration of these topics will enable the purveyor to develop a more realistic plan that identifies the specific needs of the water system and the expectations of the community. Decision makers should consider the current capability of system facilities. This should include analyzing the condition of system facilities and the current capacity of the system to produce drinking water, as follows:

1. **Limitations Imposed on the Water System.** This should include the availability of the water resource to deliver drinking water both from a quality (treatment and source protection) and quantity (aquifer/watershed source capacity and water rights) standpoint. Purveyors should conduct a water right self assessment and contact Ecology very early in the planning process to determine if water right changes or additions are necessary. Growth and development restrictions (land use designations and zoning) should be addressed. Also, funding requirements (grant and loan restrictions, available revenue from rates and other funding sources) should be a major factor to take into account before writing the plan.
2. **Potential for Growth.** Growth and development expectations should be analyzed early in the planning process. Decision makers should evaluate the potential for growth in the region served by the water system. Where applicable, growth projections should be consistent with local projections made pursuant to the Growth Management Act (GMA).
3. **Regulatory Requirements.** This should include determining and understanding all applicable local level of service regulations, state drinking water regulations and federal SDWA regulatory requirements.
4. **Level of Service/System Reliability.** The degree of reliability that will be maintained by the system should be identified before developing the plan. From a quality standpoint, policies concerning how much source protection and treatment is needed to satisfy both regulatory and customer expectations should be identified. From a quantity standpoint, policies concerning multiple sources, the amount of storage, and how aggressive a conservation program may be implemented, should be identified. At a minimum, public health requirements, such as maintaining the minimum required pressure throughout the system at all times and the development of a water shortage response plan, need to be adhered to. Also, curtailment activities must not be incorporated into the design of the system.

The degree of system reliability, above the basic minimum health requirements, is a decision that should be made by the water system with input from the customers. The water system should identify different levels of reliability and compare them with the cost to achieve and maintain each level. Key consideration should be given to how reliability levels will affect the customer's life style. A high degree of reliability may result in higher water rates. A lower degree of reliability may result in lower rates, but may also result in more restrictions on outdoor water use during

periods of drought.

Once there is a clear picture of the general makeup of the system, the potential for growth, and accepted degree of reliability that will be maintained, decision makers will be in a better position to develop the WSP.

The Planning Horizon

WSPs are intended to look ahead at least 20 years into the future in order to coincide with land use plans. Some utilities look further ahead to coincide with the life expectancy of their facilities.

The first 6 year planning period should be relatively predictable for most water systems. Thus, an improvement schedule and financial program is required for at least the first 6 years of the planning horizon. The subsequent 14 year time period is less predictable. Therefore, a more conceptual approach to improvements and financing is expected. The WSP should continually provide guidance to decision makers.

Plan Development and Review

WSPs must be developed under the direct supervision of a registered professional engineer. Many utilities find it helpful to enlist a consultant to prepare their WSPs, while some complete the planning requirement using in-house staff. DOH encourages a partnership approach that involves the system owner/decision makers, system manager/operator, city and/or county planner, engineering consultant, financial consultant, DOH, and utility customers. A preplanning conference, wherein DOH, the purveyor, the consultant, and other pertinent agencies discuss the proposed WSP content prior to plan development, is an important and helpful component of this partnership approach.

During the review process, DOH may solicit comments from the county, the State Utilities and Transportation Commission (UTC), the State Department of Ecology (Ecology), neighboring utilities and other interested parties. Their concerns may be incorporated into the WSP approval requirements. These comments must be addressed prior to final plan approval.

The WSP should be organized following the chapter outline contained in this handbook. This will facilitate coordinated review by DOH and other agencies. If you choose to use a format other than the one presented here, you should provide a “road map” which will help DOH staff know where to look for the various required elements of the WSP.

Although public involvement is not specifically required by DOH, it is highly recommended throughout the plan development process. Public involvement can help identify issues and problems which need to be resolved; help prioritize improvements; educate policy makers and consumers of potential impacts of the plan; and help achieve consumer acceptance of the issues and what will be needed to resolve identified concerns. Some systems use an advisory committee to assist in WSP development. DOH recommends that, as a minimum, the utility should conduct a public meeting or hearing. Decision makers should be kept well informed about the plan throughout its development. Other agencies or entities may have specific requirements affecting preparation of the WSP. It may be appropriate to contact them at the onset of plan development.

WSP Review Fees

DOH will charge a fee for performing the plan review. This fee covers up to two rounds of review. Additional fees will be charged for each additional review beyond the first two. The fee is based on the size of the water system. An additional fee will be charged for those elements of a water system plan which were not required at the time the legislature adopted the DOH fee schedule. These additional elements include the conservation plan, the wellhead protection plan and the cross connection control program.

Development of WSPs Covering Multiple Water Systems Under Different Ownership

It may be acceptable for several public water systems, within a given geographical area, to hire a single consultant to prepare a WSP to cover all of the systems. This may provide some cost savings to the systems. This concept would include individual specifications and information on each system. However, elements which are the same for all of the systems could be combined within the WSP. Please contact the applicable DOH regional office for further details prior to initiating development of an umbrella plan.

Development of WSPs Covering Multiple Water Systems Under One Ownership

It may be acceptable for the owner of several public water systems to hire a single consultant to prepare a WSP to cover all of the systems. This may provide some cost savings. The elements which are the same for all of the systems should be combined within the WSP. The system-specific information should be separated, with each system having a separate chapter dedicated to its system specific information.

WSP Approval

A WSP will be approved by DOH when each topic identified in this Handbook has been adequately addressed. Once approved, DOH considers a utility's plan to be a commitment to implement the actions identified in the improvement schedule. Purveyors will be expected to make decisions in accordance with their systems' WSP. However, DOH recognizes that planning is a dynamic process. Therefore, some flexibility in meeting improvement schedules may be justified.

Plan Content Checklist

The Plan Content Checklist, which is included as Appendix II, should be submitted along with the WSP. This will help ensure that the WSP is complete. It will also assist DOH in its review of the WSP.

Public Water System Coordination Act

Many areas of the state have implemented the Public Water System Coordination Act, in accordance with Chapter 70.116 RCW. This act is initiated by either the county or DOH declaring a CWSSA. CWSSA may include an entire county or only portions of it. Within these areas, a coordinated water system plan (CWSP) is developed. The CWSP includes a regional supplement, as well as the individual WSPs of the systems located within the CWSSA. The CWSP includes a number of elements, such as delineation of future service areas, land use based utility design standards which supersede DOH's general standards, and regional networks to resolve identified water supply problems. WSPs of utilities located within CWSSA must conform with the CWSP regional supplement.

Local governments may choose to develop abbreviated coordinated water system plans (ACWSP). An ACWSP is less thorough, but contains the core elements of a CWSP. The WSP must be consistent with the ACWSP, where applicable.

Relationship of the WSP to Project Construction

It is important to understand the relationship between a water system plan and projects a utility plans to develop. Ideally, all projects should be shown in the WSP. However, DOH recognizes that it is impractical to identify every water line which will be laid during the life of the plan. Therefore, the following apply:

1. The utility should show all anticipated projects in the WSP.
2. Distribution projects which are not shown in a WSP may be constructed without amending the WSP, provided that they are constructed based on the design and construction standards included in the DOH-approved WSP and the area to be served has been addressed within the scope of the WSP.
3. Non-distribution projects cannot be constructed if they are not included in a DOH-approved WSP, unless specifically authorized by DOH. An amendment to the WSP is usually required.

Table 1 - Regional Supplement Checklist

The following checklist identifies elements of the Regional Supplement of the CWSP which need to be addressed in the appropriate sections of the WSP. **This checklist should be used for utilities located within critical water supply service areas.**

Regional Supplement Element	
Map of Future Service Area	<input type="checkbox"/>
Signed Service Area and Interlocal Agreements	<input type="checkbox"/>
Water Demand Projections	<input type="checkbox"/>
Design Standards	<input type="checkbox"/>
Implementation of Regional Projects	<input type="checkbox"/>
Implementation of Water Utility Service Review Procedure	<input type="checkbox"/>
Implementation of Satellite Management Program	<input type="checkbox"/>

Local Land Use Planning

A WSP must be consistent with locally adopted land use plans and policies, such as the comprehensive plans required by the GMA.

Close coordination between the local land use authority and the water utility will result in improvements in both the land use plan and the utility's plan. Further, the comprehensive plan may have specific provisions for water service delivery which can significantly impact how a utility can grow.

To help ensure consistency with local land use, a copy of the WSP needs to be forwarded to the county planning authority for review and comment. Any issues raised by the county must be addressed prior to DOH approval of the WSP.

Table 2 - The Planning Process

The following table briefly identifies the activities involved in the development, review and approval of a WSP. The chart also lists which entity is responsible for fulfilling each activity. This chart clearly demonstrates the need for a partnership approach during this process.

Activity		Participating Entity(ies)				
		DOH	Utility or Consultant	*County Planning Authority	*UTC	*Ecology
1.	Arrange Preplanning Conference	X	X			
2.	Attend Preplanning Conference	X	X	X	X	X
3.	Prepare Plan		X			
4.	Submit Plan		X			
5.	Review Plan (90 days)**	X		X***	X	X
6.	Prepare Written Response	X				
7.	Revise Plan		X			
8.	Submit Revised Plan		X			
9.	Review Revised Plan (may result in returning to step 6)	X		X***	X	X
10.	Approve Plan	X				
11.	Adopt Plan (Optional)		X			

* DOH has working agreements with some counties, the UTC and Ecology for development and review of WSPs. Their level of involvement will vary depending on the size, ownership and location of the system. Thus, some actions identified in the chart may not be applicable for every WSP.

** DOH has a goal of completing plan reviews within 90 days of receipt.

*** Within areas subject to the Public Water System Coordination Act, the county must submit a letter verifying that the WSP is consistent with locally adopted land use plans and policies. In other areas, the county will be provided an opportunity to review and comment on the WSP.

Chapter 1

Description of Water System

Objective

The objective of this chapter is to provide basic information that will serve as a foundation for developing a comprehensive program that will meet current and future water system needs. Statutory authority is contained in Chapter 246-290-100 WAC, Chapter 246-293-250 WAC, and Chapter 246-295 WAC.

Plan Content

The description of the water system should include a discussion on the following topics:

1. Ownership and Management;
2. System Background;
3. Inventory of Existing Facilities;
4. Related Plans;
5. Existing Service Area Characteristics;
6. Future Service Area;
7. Service Area Agreement;
8. Service Area Policies;
9. Satellite Management Agencies;
10. Conditions of Service; and
11. Complaints.

1. Ownership and Management

A section that identifies the type of utility ownership and management structure should be provided. The following information should be included:

- Water system name as listed in DOH official records and the public water system identification number;
- Type of ownership, (e.g. municipal, private, individual, homeowner's cooperative, homeowner's association or other nonprofit corporation, or incorporated water company). If applicable, include copies of the Certification of Registration from the Department of Revenue, the most recent Corporate License Renewal/Annual Report or the partnership agreement;
- A brief description of the management structure and decision making process for the water system; and
- A copy of the current WFI.

2. System Background

Background planning data should be presented, and any constraints on system development should be identified. The following key topics should be discussed in this part of the WSP:

History of Water System Development and Growth : This can be a relatively brief section. Past growth within the service area should be documented and any trends should be identified. Emphasis should be placed upon the type of growth that has occurred and reasons for this growth. Past means of supplying water to the area should be discussed. The way the utility responded to past growth should be noted, and the text should explain how these historical responses apply to the present and future direction of the water system.

Geography: A general discussion of the service area's geographical features relevant to the water system. These may include natural barriers to water service, pressure zones, irrigation systems, freeway development, effects of major rivers, and the service areas of adjacent water systems.

Neighboring/Adjacent Purveyors : A map depicting any neighboring purveyors in relation to the boundaries of the water system.

Ordinances/Bylaws : Basic information that affects the design, (e.g., level of service standards and fireflow requirements).

3. Inventory of Existing Facilities

An inventory of the existing water system should be provided as basic system background information. An extensive assessment of the system's capabilities and inadequacies will be performed in Chapter 3, *System Analysis*. The inventory section should include:

- A general description of existing system facilities and major components;
- The current number of service connections, both existing and approved, but not yet connected; and
- Identification of existing interties.

4. Related Plans

Other planning activities may affect a utility's WSP. For instance, a WSP must be consistent with local land use plans and the regional supplement of the CWSP. Local critical areas ordinances and water resource plans may also have a direct impact on water system planning. This information should be obtained early in the planning process.

The WSP should identify other entities and planning efforts that could be affected by improvements which are proposed and scheduled in the WSP. If the WSP appears to be incompatible with plans of other entities, differences should be fully explained and justified. If differences can not be justified, proposed improvements should be reevaluated.

Compatibility of the WSP with the related local land use plans and regulations is required for WSP approval. Since compatibility with related plans is desirable and may be a legal requirement, it should be addressed at the outset of the planning process. The WSP should

include a brief analysis of each related plan with the water system. This analysis must include:

- Identification of any inconsistencies with related plans and a discussion of how each inconsistency is addressed;
- Applicable comments from agencies regarding the relationship between the WSP and the related plan along with documentation on how issues were resolved; and
- Identification of adjacent purveyors. (Each adjacent purveyor must be notified of WSP development and be allowed opportunity to comment on it. The WSP must document how all issues with adjacent purveyors were resolved. All written responses received must be included.)

Primary attention should be given to adopted plans. However, DOH urges purveyors to contact appropriate agencies and the county planning department to determine what changes, if any, are anticipated in the immediate future which could impact their water systems.

The following related plans should be discussed in the WSP, if appropriate:

- GMA related plans, policies and development regulations;
- Other related land use and comprehensive plans;
- Coordinated water system plans (regional supplement);
- Abbreviated coordinated water system plans;
- Stormwater plans;
- Wastewater plans;
- On-site sewage disposal regulations;
- Wellhead protection programs;
- County water and sewer general plans;
- Ground water management plans;
- Basin plans; and
- WSPs for the following:
 - Water systems located within the proposed future service area;
 - Water systems adjacent to the proposed future service area;
 - Water systems to be served by the water system;
 - Entities which are approved as Satellite Management Agencies that could provide service within the future service area; and
 - Regional water systems selling water to the water systems.

5. Existing Service Area Characteristics

A utility's service area is comprised of an existing and future service area. The existing service area is the area where the utility currently provides service (i.e. where it has "pipes in the ground"). This section of the WSP must include:

Existing Service Area Map : A map of the water system showing locations of supply, storage, treatment, distribution and other facilities must be included. In areas of varied topography, the system map should show pressure zones and elevations of key points as needed to understand the hydraulic performance of the system.

Zoning and Land Use : Zoning and land use designations must be included on the existing service area maps along with a narrative description of land use patterns and activities within the existing service area.

6. Future Service Area

The future service area is the area in which a purveyor intends to provide future water service. If a utility is going to expand beyond its existing service area, the WSP must identify the future service area. If a purveyor does not intend to expand beyond the utility's existing service area, then the future service area will be the same as the existing service area. If there is a conflict with adjacent purveyors regarding who will provide service within a portion of the proposed future service area, it must be identified along with a strategy for resolving the conflict.

Identification of a future service area carries with it the responsibility for providing water service to that area in a timely and reasonable manner. The WSP should identify what service options are available within the future service area. Examples of service options include direct line extensions, satellite management and temporary arrangements through an adjacent utility. It is important to identify how service will be provided throughout the entire service area.

Once the existing service area is delineated, the utility's capability and desire to extend service should be evaluated. Key considerations affecting the ability to expand the service area include availability of source, storage, system hydraulics, limitations on service delivery imposed by local land use plans, water rights, and the service areas of neighboring systems.

Pursuant to the Public Water System Coordination Act, water utilities located in CWSSAs assume a higher level of commitment to provide water service in a claimed future service area. The responsibility to provide water service in a timely and reasonable manner becomes a formal requirement. If a purveyor is unwilling or unable to provide service in a timely and reasonable manner, a structured process to direct requests for water service to other purveyors is specified by law. In addition, a local process is specified for the removal and reassignment of portions of a utility's future service to that of another utility.

Criteria used to establish future service area boundaries may include such elements as: topography; natural features (such as rivers); citizens' identification with a particular community; existing and future sewer service; ability and readiness of the utility to provide water; source limitations; franchise areas; boundary review board decisions; projected

population and land use; location of other boundaries; county or city land use plans (including urban growth areas, community or subarea plans); annexation policies; satellite service policies; CWSP policies; conditions on water rights; and political choice.

This section of the plan must include a map and written justification for claiming a future service area.

Future service area boundaries of neighboring water utilities should also be shown on the map. If boundaries for neighboring systems are unknown, the circumstances should be addressed in the text. Within CWSSAs, any overlaps must be resolved before the WSP is approved by DOH. If a water system does not intend to expand its existing service area, the rationale for the no expansion policy should be provided in the text of the WSP.

Circumstances related to future service areas which support the boundaries identified on the map should be discussed. These might include:

- Local land use plans, policies, and development regulations;
- CWSP regional supplement;
- Abbreviated coordinated water system plans;
- Voluntary agreements negotiated with and signed by neighboring water utilities;
- Water rights, including place of use;
- Official boundaries approved by a boundary review board (Chapter 36.93 RCW), which apply to municipal corporations in some counties; and
- Franchise area if special conditions are attached. Usually, franchise areas would not be helpful because a county may allow more than one utility to use county rights-of-way within the same area.

7. Service Area Agreements

To ensure efficient planning, future service areas of adjacent water utilities should not overlap. This helps avoid duplication of facilities, and/or costly oversizing of facilities. A service area agreement provides a mechanism to accomplish that goal. Service area agreements are required for utilities located in critical water supply service areas and may be required by county government under the GMA.

Purveyors should attempt to obtain service area agreements with neighboring water systems. In some cases, a considerable amount of time may be needed to reach agreement between systems. DOH and local governments may conduct informal meetings or formal hearings to resolve conflicts between neighboring water systems.

The WSP must include a signed service area agreement if the system is located within an area planning pursuant to the Public Water System Coordination Act and should include a service area agreement for all other areas. The text of the agreement should address the following:

- Mechanisms to transfer areas of common service between utilities;
- Boundary streets including service provision adjustments;
- Boundary adjustments; and

- Terms of agreement.

8. Service Area Policies

Service area policies are extremely important in a utility's endeavor to develop water service within a defined service area. They will ultimately guide the development and financing of the infrastructure required to provide water service throughout the service area. They should be derived from goals developed by the utility. Service area policies and conditions of service should be clearly defined prior to submitting the WSP to DOH for review.

This section identifies and defines policies which affect and guide the development of a water system and provides direction as to how a utility will respond to requests for water service within its service area. Purveyors of utilities located in CWSSAs are required to identify how service will be provided throughout their entire service area, and we recommend that all purveyors should do so. For example, the WSP should clearly state whether requests for water will be accommodated strictly through direct service or will be provided through a combination of direct and satellite/remote service.

A utility's service area policies may apply to various sections of the WSP. However, the policies should be presented in one location. Purveyors should publish a separate service area policy brochure for distribution to persons interested in developing within the systems' service area.

There are numerous service area policies which are important in guiding the development of a water system. The text should include a brief summary of each applicable policy and its basis. Emphasis should be given to those policies which relate to public health protection. Policies which should be defined include but are not limited to:

Wholesaling Water: Will the purveyor provide water to other utilities on a wholesale basis? What conditions must be met to obtain a wholesale agreement?

Wheeling Water: Will the purveyor allow the system's mains to be used to wheel water to another water system? What conditions must be met, such as compatibility of water quality and engineering?

Annexation: How does city or district annexation relate to the provision of water service? Is annexation required in order to obtain water service?

Direct Connection and Satellite/Remote Systems: What is the purveyor's policy on new developments in the service area? Must they directly connect to the existing water system or are satellite or remote systems allowed? If satellite systems are allowed, what is the criteria for determining if and when the satellite system must connect into the main system?

Design and Performance Standards: What are the purveyor's minimum design and performance standards for new development?

Surcharge for Outside Customers: If the utility imposes a surcharge on customers outside its corporate boundaries, what is the rationale for the surcharge? Does the surcharge affect system growth? What is the surcharge?

Formation of Local Improvement Districts Outside Legal Boundaries : Will the purveyor work with property owners to develop a financial strategy that will facilitate construction of water facilities?

UGA: If the water system is located within a UGA, what is the purveyor's responsibility to provide water at urban levels of service and how will it be provided within the UGA? Will new development be expected to pay for extensions or will the purveyor proactively finance facilities in anticipation of growth?

Late-Comer Agreements : What is the purveyor's policy on allowing late-comer agreements for applicants or developers who propose to extend the water system? How do the agreements affect system expansion?

Oversizing: Will the purveyor provide funds to install larger facilities than may be needed to provide service to a development so that future developments in that portion of the service area may be served?

Cross-Connection Control Program : What is the purveyor's policy and authority on regulation of cross-connections within the water system?

Extension: What is the policy regarding extension of the system resulting from service requests? Who is responsible for costs associated with the extension? If the purveyor will consider extensions, what specific design standards and payment requirements are included in conditions of service.

9. Satellite Management Agencies

A purveyor considering becoming a DOH-approved SMA must develop a satellite management program, (see DOH's *Satellite Management Handbook*). The purveyor should determine the size of systems to be served and the types of systems to be served, (e.g. community and non-community).

There are three major categories of satellite management services:

- Ownership;
- Management and Operation; and
- Contract services.

An SMA that will not own all utilities or provide comprehensive operation of the utility must clearly delineate what services it will and will not provide.

10. Conditions of Service

Conditions of service are specific requirements that facilitate the implementation of the utility's service area policies. Where possible, conditions of service should be included in the discussion of the actual service area or other utility policies. For example, a city may have a service area policy which states that all new developments located outside of the city limits may not oppose annexation at the time of an annexation request. The condition of service would state that an annexation agreement must be signed by the applicant in order to receive service.

Conditions of service should be readily available to applicants and developers in a handout or a water service application form.

Conditions of service requirements which should be considered are:

- Purveyor responsibilities;
- Customer responsibilities;
- Connection fee schedule;
- Meter and materials specifications;
- Consent agreements for inspection, maintenance, and repair activities which may disrupt water service;
- Cross-connection control requirements;
- Late-comer pay back provisions; and
- Developer extension requirements, design standards, financing responsibilities, or professional engineer design required.

11. Complaints

The utility should be maintaining records of all complaints, including any corrective actions taken. The plan should provide information on the number and nature of customer complaints and describe how these complaints are addressed, including:

- Describe the policy and process for dealing with complaints; and
- Identify record keeping

The complaint record should be available for inspection during sanitary surveys.

Chapter 2

Basic Planning Data and Water Demand Forecasting

Objective

The objective of this chapter is to define basic planning data, future land use and future water demands, so that purveyors can adequately plan to accommodate their water needs. Statutory authority is included in RCW 90.03.290, RCW 90.54.020, RCW 70.116, Chapter 246-293 WAC and WAC 246-290-100.

Plan Content

This chapter should address two main areas:

1. Current Population, Service Connections, Water Use; and Equivalent Residential Units; and
2. Projected Land Use, Population, and Water Demand for 6 and 20 Year Horizons.

Water use data collection and water demand forecasts, as presented in this chapter, are two of the three required elements of a conservation plan. The third element, a conservation program, is discussed in Chapter 4.

1. Current Population, Service Connections, Water Use, and Equivalent Residential Units

Current Population

The current population served in the residential sector must be identified. The average population per residential unit (both single-family and multi-family) should be available from the local government planning agency. The number of residential connections may be multiplied by the average household population for the area to determine residential population served. Purveyors should consider population characteristics (e.g. high seasonal use and large retirement communities) which are unique to their service area(s) when determining current residential population.

Total Service Connections

The current number of service connections must be identified for the following customer classes:

- Single-family;
- Multi-family;
- Commercial/Governmental/Industrial; and
- Agricultural.

Water Use Data Collection

Water use data must be collected consistent with the *Conservation Planning Requirements*, available from DOH. Requirements vary depending on the system size and location. Data collected will be used for:

- Forecasting demand for future water needs;
- Planning for new source development;
- Planning for facility design and operation;
- Evaluating the success of conservation programs being implemented;
- Assisting the state in making water resource management decisions;
- Developing regional water use patterns;
- Assisting systems in making water resource management decisions; and
- Identifying future initiatives in water conservation.

Please reference the *Conservation Planning Requirements* and conservation checklists for a complete listing of types of data required to be collected. Checklists defining data collection requirements for all sizes and locations of systems are available from DOH regional offices. These checklists will be used by DOH and Ecology staff in reviewing data collection efforts. Purveyors are **strongly encouraged** to utilize these checklists and submit them with their draft WSPs to ensure all data elements have been addressed. Utilities are encouraged to collect more data, if needed, to develop more accurate assessments or enhanced conservation programs. Purveyors will report certain data elements annually as part of the WFI.

To meet minimum requirements, WSPs must contain **currently available** data on water usage. If the data has not been collected, purveyors will be required to make a commitment to begin collecting the required data. This commitment must include a schedule identifying when the required data will be collected and what improvements, if any, will be made to ensure the data is collectable. If required water use data is not collected, the utility may be unable to receive subsequent WSP approvals or approval for additional water rights from Ecology. Systems which do not have source or service meters will be required to estimate use. Data may be collected through normal billing procedures. Monthly data may be estimated if systems bill less frequently. For systems that bill once a year or less frequently, data must be collected at least semi-annually; once during April to September and once during October to March.

Equivalent Residential Units

Water purveyors should convert current water usage, the physical capacity of the system and projected water usages for the 20 year planning period into equivalent residential units (ERUs). An ERU is defined as the amount of water consumed by a typical full-time single family residence. For example, let's assume that a system has been determined to have sufficient physical capacity to serve 100 full-time single family residences. That system would be able to serve any combination of commercial, industrial, and residential customers, provided that the quantity of water used is equivalent to the projected needs of 100 full-time single family homes (i.e., 100 ERUs). To calculate ERUs, please refer to the DOH *Waterworks Standards Guidance Manual*.

2. Projected Land Use, Future Population, and Water Demand

Projected Land Use

Existing land use patterns should be briefly described and mapped as a starting point for projecting future growth. The WSP should identify the land use and/or zoning designations, (see Chapter 1, *Description of Water System*). Land use policies and requirements, zoning, documented growth trends, and other adopted land use plans should be assessed in developing future land use patterns for system's existing and future service area(s). Any deviation from these plans must be explained and justified. Future land use projections must be consistent with adopted comprehensive land use plans rather than being developed independently. Future land use patterns should be projected for 6 years and 20 years. The following parameters of land use should be considered:

Type of development : Water use varies with the type of development. Therefore, it is important to distinguish between residential (single family vs. multi-family), commercial, industrial, and other categories of development within service areas.

Amount of development : Population density or extent of development must be known in order to accurately project future water use.

Location of development : Sizing and routing of facilities depends upon the location of future development.

Timing of development : When growth will occur is a crucial dimension of land use that affects both the design and scheduling of water system improvements.

Projected Population

Population forecasts must be consistent with GMA projections developed by the appropriate local planning agency, based on information obtained from the OFM. If different forecasts are used, justification of these differences must be included, and the local planning agency should review these alternative projections. Any comments from the local planning agency must be included with the WSP.

The WSP should include a map and/or chart showing existing and future population. All assumptions must be clearly stated and justified.

Projected Non-Residential Water Needs

Estimating future water demand for non-residential users is vital to appropriately plan for and accommodate these users. To estimate future water demand from non-residential users, systems should identify current water uses from each of these customer classes, define future projected water use based on land use, and project needs within each such customer class. Assumptions used in developing demands from non-residential users must be clearly identified. DOH is developing waterworks standards which will provide further information regarding non-residential demand projections.

Projected Non-Revenue Water

“Unaccounted for” water, such as from leaks and main flushing, may provide opportunities to reduce water usage that may not otherwise be apparent. It is beneficial to incorporate this component into the system’s estimated future water demand.

Water Rates and Rate Impacts on Water Demand

All purveyors must provide existing rate schedules. Public water systems with more than 25,000 connections will also be required to incorporate the projected impacts of rate schedules on future water demands. A discussion of existing rate structures and any proposed changes should be included in Chapter 9, *Financial Program*.

Water Demand Forecasting

To adequately serve new customers, purveyors should forecast what future water needs will be and ensure that water is available to meet those needs as growth occurs. To obtain additional water rights from Ecology, systems must have demand projections that justify the need. Knowing the quantity, location and time when water will be needed allows systems to plan for new source development prior to full utilization of existing water sources. This planning leads to securing the financing and permit approvals necessary to develop new sources. Water demand forecasts, combined with the hydraulic analysis and storage analysis of the present system, can be used to identify needed improvements. The forecasts should be presented in a table, chart, or graph, and include a map showing the location and quantities of high future water demands. Future water demand projections, for both residential and non-residential uses, must be expressed in maximum instantaneous and total annual volumes and should also be expressed in ERUs.

Water demand forecasts must be prepared consistent with the guidelines contained in the *Conservation Planning Requirements*. Requirements vary depending upon the number of connections in the system. For systems with fewer than 10,000 connections, a single forecast for all customer classes may be developed. For all systems with 10,000 or more connections, forecasts must be prepared for the four customer classes as listed on the first page of this chapter. Please reference the *Conservation Planning Requirements* for a list of the factors which must be considered when developing water demand forecasts.

All system forecasts must include projections which depict demand for 6 years and 20 years into the future, for both peak instantaneous demand and total annual demand. These forecasts must also show demand with and without projected conservation savings obtained from the system’s conservation program.

The utility should utilize the conservation checklist when developing the demand forecasts. The checklist should be submitted along with the WSP to ensure that all required elements have been addressed.

Where water demand forecasts indicate that water needs will exceed water right parameters within 20 years, purveyors must begin to plan for obtaining additional water rights as noted in Chapter 4, (Water Right Evaluation - Assessment of Need for Additional Water Rights).

Chapter 3

System Analysis

Objective

The objective of this chapter is to determine if the existing system facilities are capable of supplying sufficient quality and quantity of water to meet existing and projected demands as identified in Chapter 2, *Basic Planning Data and Water Demand Forecasting*. Statutory authority is included in Chapter 246-290 WAC.

Plan Content

If the analysis of existing system facilities concludes that additional facilities are needed, alternative improvements should be evaluated and the most prudent option(s) selected. To complete this process, the following items should be included in the WSP:

1. System design standards;
2. Water quality analysis;
3. System description and analysis;
4. Summary of system deficiencies; and
5. Selection and justification of proposed improvements.

1. System Design Standards

The design standards section should include a discussion of all standards that apply to the system, (e.g., *DOH Waterworks Standards Guidance Manual*, regional supplement of a coordinated water system plan, and county/city level of service standards.). In this section, the most stringent standards for all system facilities should be identified. The design standards must be adequate to protect basic public health. Many utilities choose to provide a higher level of reliability than the state minimum. The utility may have a different standard for new versus replacement facilities.

Standards should be established and listed in the WSP for each component:

- Water Quality Parameters;
- Average and Maximum Daily Demands;
- Peak Hour Demand;
- Storage Requirements;
- Fire Flow Rate and Duration;
- Minimum System Pressure;
- Minimum Pipe Sizes;
- Telemetry Systems;
- Backup Power Requirements;
- Valve and Hydrant Spacing; and

- Other System Policies that Affect Performance and Design (e.g. Looping).

In addition to identifying the system's design standards, the purveyor should establish construction standards. This will allow the purveyor to proceed with distribution projects without having to submit project reports to DOH. Design and construction standards should be attached to the WSP as an appendix (see Chapter 7 *Distribution Facilities Design and Construction Standards*).

2. Water Quality Analysis

Group A public water systems must comply with the provisions of the SDWA. Washington's water quality provisions, contained in Chapter 246-290 WAC generally incorporate the SDWA requirements. Due to resource and legal process constraints, the state rules tend to lag behind the SDWA timelines. Therefore, compliance with the current state rules does not guarantee compliance with all current federal rules. Also note that, under certain circumstances, DOH is authorized to waive some SDWA monitoring requirements.

A critical component of any water system is the quality of its source water. Raw water quality dictates the need for mandatory or voluntary treatment. A general description of the raw water quality and treated water quality, if applicable, should be included for each source. Any trends that have developed (e.g., rising level of nitrates, turbidity, coliform findings) should be discussed. Water quality violations should be summarized along with a description of the actions taken by the system to address these violations.

Another critical component is finished water quality. This includes the quality of water throughout the distribution system and at the consumer's taps. The effectiveness of treatment processes, the ability to maintain chlorine residual throughout the distribution system and corrosion control should all be addressed. This section should also include an evaluation of water quality related complaint records.

3. System Description and Analysis

Using the system's performance design standards, this section should include a description of the general condition of each system facility as well as an analysis of the physical capacity of each facility. This analysis should look at each facility individually and as a functional component group, (i.e., source, treatment, storage, and distribution). The description of the general condition of system facilities should include a summary of the physical condition of the facility as well as the facility's anticipated remaining life expectancy. The analysis should also include a comparison of the existing facility capacity with the existing and projected water demands identified in Chapter 2.

Completing the description and analysis section will result in the identification of the extent and timing of any individual facility and/or functional group deficiencies. If the system has more than one pressure zone, this analysis should be conducted independently for each pressure zone. Deficiencies identified in the first 6 years of the planning period should be addressed and remedied by a specific project or action, including a project schedule. Deficiencies identified in years 7 through 20 may be placed in the capital improvement program as an unscheduled project.

Each identified deficiency should be summarized and resolved in the Summary of System Deficiencies and the Selection and Justification of Proposed Improvement Projects sections that conclude this chapter.

The System Description and Analysis section should include a discussion of the general description and condition and a capacity analysis for the following facilities:

- Source;
- Treatment;
- Storage; and
- Distribution System

Source

A. General Description and Condition

The general description and condition of the source of supply should include:

- Maximum instantaneous withdrawal rate and sustainable withdrawal rate for each source;
- Current condition of each source;
- Facility age and estimate of future life expectancy;
- Fluctuations and/or trends in source capacity (e.g., reduction due to sand buildup);
- Variations in water table levels, river flows, etc.;
- Condition of intake facilities; and
- Condition and capacity of transmission mains.

B. Source Capacity Analysis

Tables 3 and 4 in Chapter 4 should be used to complete the system's source capacity analysis. These tables will enable a utility to determine if the existing source(s) have sufficient capacity to satisfy existing and projected demand for 6 and 20 years. This analysis should identify the quantity and timing of any needed additional source capacity.

Water Treatment

A. General Description and Condition

If the system currently has a treatment process, the following information should be provided:

- Type of treatment process;
- Maximum instantaneous treatment rate and sustainable treatment rate for each facility;
- Disinfectant residuals;
- Current condition of each treatment facility;
- Facility age and estimate of future life expectancy;
- Fluctuations and/or trends in treatment capacity (e.g., reduction in treatment rates due to higher turbidity); and

- Evaluation of treatment performance.

B. Water Treatment Capacity Analysis

Based on the existing and projected demands for water identified in Chapter 2, include an analysis to determine if the existing treatment facilities have sufficient capacity. Identify the timing and extent of any deficiencies.

Storage

A. General Description and Condition

Provide the following information in this section:

- The type, material and usable capacity of storage facilities used;
- Current condition of each storage facility;
- Turnover of water (e.g., how long does it set in the reservoir);
- Pressure zone;
- Facility age and estimate of future life expectancy; and
- Date of last inspection/cleaning/coating, if applicable.

B. Storage Capacity Analysis

A system's storage capacity analysis consists of four parts: operational; standby; equalizing; and fire flow. The first part of this section should identify the minimum volumes required for storage. The second part should determine if the system has sufficient storage facilities on line.

The required storage capacities for the 6 and 20 year planning periods should be presented. The existing installed capacities should be compared to the projected required storage capacities to identify the amount and timing of any additional needed storage facilities.

When computing the required storage requirements, the local fire authority's requirements should be documented and factored into the analysis.

Distribution System

A. General Description and Condition

This section needs to include:

- The length, diameter, and type of pipe in the system;
- The pressure zones in the system (e.g., general location, operating pressures);
- General condition of all distribution facilities;
- Water/sewer line separation requirements;
- Locations of dead end lines;
- Frequency, cause and type of system leaks;
- Distribution system replacement program;
- How system pressures are monitored and reported;

- Method(s) of recording changes in the distribution system are recorded (e.g. computer mapping system, manually); and
- Required valve locations and hydrant spacing.

B. Hydraulic Capacity Analysis

A detailed hydraulic analysis should be completed and summarized in this section.

The hydraulic analysis is used to:

- Evaluate existing system performance and identify deficiencies;
- Aid in identifying needed system improvements; and
- Document any special operational needs.

This section should include:

- Methodology used to conduct the hydraulic analysis, including the name and description of the program;
- Statement and explanation of assumptions (e.g., roughness coefficient and minimum pipe size analyzed);
- Determination of and justification for pressure limitations used;
- Description of the various scenarios considered (e.g., locations, conditions, etc.);
- Discussion and verification of input data derivation and model calibration to the system;
- Statement of minimum pressures;
- Summary of deficiencies identified in the analysis; and
- A map describing the network (e.g., nodes and pipelines) analyzed.

4. Summary of System Deficiencies

Review of the individual system component analysis sections may identify a number of system deficiencies and needed improvements. A list of system deficiencies, by functional group, should be established with each item briefly described. This section may also serve as a checklist to ensure that all potential concerns about the water system have been addressed in previous sections. The list of deficiencies should be prioritized. This will simplify assessment of various improvement alternatives and formulation of improvement schedules in the next section.

When evaluating water system needs, DOH gives highest priority to health related issues. Any system deficiencies, particularly those addressed through departmental orders, that have not been documented in previous sections should be discussed in this section.

5. Selection and Justification of Proposed Improvement Projects

This section should contain an analysis and discussion of potential improvements that will resolve or eliminate any existing and anticipated deficiencies. The PE submitting the WSP

is responsible for identifying and evaluating **all** reasonable options available to the system, based on a reasonable degree of engineering expertise.

For each deficiency, the study of the alternative improvements should identify the costs, benefits and drawbacks of each identified option. If only one option is identified, include a justification or explanation why no other options were considered. When identifying alternative improvements, include initial and ongoing cost of implementation, reliability and redundancy, operation and maintenance technical demands, system physical capacity goals, and political choice.

When an improvement has been selected, the justification for selecting that particular option should be included. The length and detail of this discussion will vary depending on the number of reasonable options.

If the collective economic impacts of the proposed improvements appear to be burdensome, the purveyor should reevaluate the initially proposed improvements. This exercise should result in a realistic program to address any existing or anticipated deficiencies for both the 6 year and 20 year planning horizons.

The criteria used to prioritize and select identified projects should be included in the improvement program.

Chapter 4

Conservation Program, Water Right Analysis, System Reliability, and Interties

Objective

The objective of this chapter is to develop a conservation program that will promote efficient water use, ensure adequate water rights are secured for existing and future needs, promote system reliability, and describe existing and proposed interties. Applicable state laws include RCW 90.03.005, .080, 383(3), and .400, RCW 43.20.230, and .235; RCW 43.70.310, RCW 43.27A.090(6), RCW 90.44.110, Chapter 90.46 RCW, RCW 90.54.020(2)(6), .050 and .180, as well as WAC 246-290-100 and Chapter 173-590 WAC.

Plan Content

This chapter should consist of five main sections:

1. Conservation Program Development and Implementation;
2. Source of Supply Analysis;
3. Water Right Evaluation;
4. System Reliability; and
5. Description of existing and proposed interties.

A conservation program, as presented in this chapter, is one of the three required elements of a conservation plan. The other two elements, water use data collection and water demand forecasting, are discussed in Chapter 2, *Basic Planning Data and Water Demand Forecasting*.

1. Conservation Program Development and Implementation

Development and implementation of cost effective conservation programs is required both for approval of a WSP and when applying for new water rights from Ecology. Conservation program requirements are dependent upon the size of a system; the larger the system the more detailed and comprehensive the guidelines and requirements.

Please refer to the *Conservation Planning Requirements* and conservation checklists, available from DOH, to determine specifically which conservation planning measures must be evaluated and implemented. The checklists will be used by DOH and Ecology staff in reviewing the conservation program. Systems are strongly encouraged to utilize and submit these checklists to ensure all measures have been addressed.

Required Measures for All Systems

Program promotion, including publicizing the need for water conservation through media outreach and other means, is required in all water conservation programs. Source meter installation is required for sources. Additionally, if unaccounted-for water exceeds 20 percent, the conservation program must identify implementation of a program which includes detection and repair leaks and other measures necessary to reduce losses.

Other Recommended Measures and Level of Implementation

In addition to the mandatory conservation measures described above, water systems, depending on size, are required to conduct a written evaluation of other conservation measures and implement those which are cost effective. To identify the conservation measures which are required to be evaluated for each size system, refer to the *Conservation Planning Requirements*. If systems will be pursuing additional water rights within 20 years, the evaluation of other conservation/efficiency measures as described in the *Source of Supply* section later in this chapter must also be conducted.

Purveyors must determine the appropriate level of implementation for selected measures. This evaluation of conservation measures should reflect considerations specific to the system, including the cost of service, cost of new supply sources, competing demands for water, and unique conservation opportunities. Purveyors are encouraged to evaluate and implement conservation measures which exceed the minimum required standards.

In the evaluation of conservation measures, purveyors are required to explain and justify the selection of measures and the level of implementation provided in their water conservation programs. This explanation may be narrative and non-quantitative, but should be supplemented by technical quantitative analysis if available. In the absence of clear evidence to the contrary, estimates of the value of conserved water and of costs and benefits will not be challenged.

Conservation Program Outline

To assure consistency of review by DOH and Ecology, conservation programs should conform to the following format. Providing information in this format will facilitate an expeditious review of WSPs and water right permit applications.

Conservation Objectives : Goals and objectives of the conservation program must be identified. These objectives should be designed to meet the needs of the specific water system (e.g., attain maximum utilization of current supplies, reduce peak daily consumption, reduce peak monthly consumption, etc.). Each system must develop conservation objectives which logically meet its needs.

Evaluation of Conservation Measures : Purveyors must evaluate all recommended conservation measures identified for their size system, and implement those that are required and those that are cost effective or meet the system's needs. Decisions not to implement measures required to be evaluated need to be explained. Finally, purveyors are encouraged to evaluate measures above the minimum requirements.

Identification of Selected Conservation Activities : This must include a description of all implemented or scheduled conservation measures, along with a schedule and budget. The system must also include a description of how it will monitor the success of its conservation measures.

Target Water Savings Projections: Each system will need to identify a percentage savings goal that the entire conservation program is expected to achieve. This savings goal is to be based upon the conservation measures chosen for implementation. The makeup of each system is unique, therefore no percentage savings goal has been established by DOH. This percentage savings goal must be factored into the water demand forecasts as identified in Chapter 2.

Regional Conservation Programs

Systems may develop conservation programs independently or they may participate in the development and implementation of a regional conservation program with other systems. If a system can demonstrate that a regional planning organization is performing conservation measures for the individual system, that system will not be required to duplicate those measures, provided the benefits to the individual system from the regional effort equal or exceed the benefits which could reasonably be expected from implementation of the measures by the individual system. Additional details regarding conservation programs for systems which purchase or sell wholesale water are provided in the *Conservation Planning Requirements*.

2. Source of Supply Analysis

It is becoming increasingly difficult to obtain new or expanded water rights from Ecology, without first demonstrating that the system has seriously considered other options. The purpose of the source of supply analysis is to evaluate opportunities to obtain or optimize the use of existing sources already developed, and evaluate other innovative methods to meet water needs. A source of supply analysis is required of all systems that will be pursuing water rights within 20 years of approval of their WSP as defined by the water demand forecast (see Chapter 2, *Basic Planning Data and Water Demand Forecasting*). Systems not pursuing additional water rights are also encouraged to conduct a source of supply analysis as discussed in this section, this analysis is not required.

As part of the source of supply analysis, purveyors are required to develop a written analysis of the feasibility and cost effectiveness of implementing the alternatives listed below. If cost effective, these measures should be pursued in lieu of new source development. The cost effectiveness of these alternatives should reflect considerations specific to each system. This includes the cost of service, cost of new supply sources, competing demands for water, unique conservation opportunities, and environmental costs to the extent they can be quantified. Criteria for the analysis are detailed below.

Enhanced Conservation Measures

In accordance with the *Conservation Planning Requirements*, public water systems are required to develop and implement conservation programs. The Conservation Program, as discussed thus far, is considered to be the minimum program acceptable to DOH and Ecology. The enhanced conservation measures identified in the source of supply analysis are in addition to the minimum acceptable program identified in the *Conservation Planning Requirements*.

For the purposes of the source of supply analysis, systems required by the *Conservation Planning Requirements* to evaluate small system measures should also evaluate medium size system measures. Those systems required to evaluate medium system measures should evaluate large size system measures. Finally, those systems required to evaluate large system measures are encouraged not only to evaluate these measures, but also to evaluate additional measures that will strengthen or enhance the effectiveness obtained from a conservation program.

Water Right Changes

Changes to a water right must be approved by Ecology. Water right changes include a variety of options, including changes in place of use, purpose of use, and to the point of diversion or withdrawal of water, as well as the addition of points of diversion or withdrawals. Any opportunity to utilize existing water rights via change(s) in water right parameters, in lieu of pursuing new water rights, should be evaluated as part of this section.

Interties

Interties include the physical connection of two or more water systems to allow the exchange or delivery of water between systems. Water conveyed through the use of an intertie generally needs to meet the criteria for water right changes. The law provides a process for approval of interties based upon the criteria described later in this chapter. Opportunities for interties with neighboring systems should be evaluated for feasibility, and pursued if deemed more cost effective and viable than new source development.

Artificial Recharge

Artificial recharge is the injection or infiltration of available surface water (usually from high winter flows) or other available water into an aquifer and its subsequent withdrawal. An artificial recharge program should meet all of the following parameters in order to be considered viable:

- The surface water to be used to recharge the aquifer should be under a current water right eligible to be changed for this purpose, or a water right must be obtainable;
- The additional quantity of water which is likely to be available to be withdrawn as a direct result of recharging is quantifiable;
- The additional water to be withdrawn from the aquifer will not impair other water rights;
- If hydraulic continuity exists between the aquifer and a surface water source, the recharging and subsequent withdrawal shall not impair the surface water source;
- The water quality of the aquifer will not be degraded; and
- The aquifer should be capable of retaining recharge water so that such water is available for retrieval.

Use of Reclaimed Water, Reuse and other Non-potable Sources

The use of reclaimed water and other non-potable sources can be a valuable resource in meeting a utility's water demands. As part of the evaluation of this alternative, systems should examine opportunities for reclaimed water, reuse, non-potable water and greywater as an approach to providing additional water. This includes identification of potential sources of reclaimed water, industrial process water, non-contact cooling water and the potential for ground water recharge. The identification and location of potential users, as well as contracting for delivery of reclaimed water need to be evaluated. The evaluation should carefully look at where these additional sources of water are located in relation to high water use areas. Large water users should also be examined for potential reclaimed

water and reuse options to reduce potable water supply demands. It should be noted that state law requires certain reclaimed water projects to be adopted within a sewer/water comprehensive plan. Reclaimed water proposed for created wetlands, surface spreading to recharge ground water and streamflow augmentation, requires the project to be identified in an appropriate sewer/water comprehensive plan. Implementing reclaimed water and reuse strategies can also stretch water rights and can provide potential mitigation in areas with limited water availability. Potential areas to be analyzed include:

- Irrigation of public green spaces (e.g. golf courses, school playgrounds, athletic fields, arboretums and public walk ways);
- Uses for commercial and industrial cooling water;
- Gravel washing and other processes;
- Non-potable uses in large commercial/industrial buildings (e.g., toilet flushing water and heating and cooling water);
- Ground water recharge and storage of reclaimed water;
- Greywater utilization programs for sub-surface irrigation uses;
- Reclaimed water for created wetlands and recreational impoundments; and
- Streamflow augmentation and fishery enhancement.

Other uses and requirements for reclaimed water may be found in *Water Reclamation and Reuse Interim Standards*. This document is available from either Ecology or DOH.

Treatment

When additional sources of supply are being pursued as a result of water quality problems with existing sources, purveyors should evaluate the cost of treating the current source. This analysis should include discussion of the water quality problems, currently available treatment alternatives, costs of treatment, and other details appropriate for the specific water quality problem.

The following definitions may assist you in evaluating the use of reclaimed water, reuse, and other non-potable sources:

Reclaimed Water is effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a direct beneficial use or a controlled use that would not otherwise occur. Ecology and DOH have developed standards for the use of reclaimed water which is regulated under Chapter 90.46 RCW.

Reuse Water is industrial cooling water or process water (treated or untreated) that does not contain domestic sewage that may be used with little or no additional treatment. Reuse water may require an Ecology water quality permit for reuse, but requirements for this water are less stringent than for reclaimed water.

Non-Potable Water is water derived from other non-potable sources such as shallow ground water, irrigation water, surface supplies and artificially stored ground water (see Artificial Recharge).

Greywater is wastewater that has the consistency and strength of residential domestic type wastewater. Greywater includes wastewater from sinks, showers and laundry

fixtures, but does not include toilet or urinal waters. Greywater may be used as an alternate source of irrigation water if properly pre-treated. Untreated (settled and screened) greywater may be used sub-surface for irrigation of landscaped areas on single family, multi-family or small commercial application. Greywater strategies are best used in conjunction with other reclaimed water and reuse programs to reduce peak day flows and stretch existing source of supplies and water rights.

3. Water Right Evaluation

Permits, Certificates, Claims and Applications

A list of all water right permits, claims, certificates, and pending water right applications and change applications must be included in the WSP. This includes defining all of the parameters of these rights in a narrative overview and as part of Tables 3 and 4, as described below. The purpose of Table 3 is to identify water right parameters/limitations and compare this information with existing water usage to determine any excess or deficiencies in such rights. The purpose of Table 4 is to identify water right parameters/limitations and compare with forecasted water needs to determine any future excess or deficiencies in such rights. To assist in completing the narrative overview and Tables 3 and 4, instructions for describing each of the various water right parameters is provided. If water is obtained from another purveyor through an intertie for non-emergency supply purposes, this information must also be presented in the tables to account for *all* water sources utilized. Finally, any other agreements, court orders, pending legal action, or other restrictive conditions related to the utilization of water rights must be noted.

Purveyors, in coordination with Ecology, must determine if water right changes (including changes to place of use descriptions) are necessary to reflect current and projected water usage. If such changes are necessary to ensure existing water usage is within water right limits, immediate actions must be identified to make such changes and be included in the improvement schedule. Ecology regional offices should have all necessary water right information on file and available for use.

Narrative Description

- **Source Type** - Indicate source type - surface water, ground water or springs.
- **Source Location** - Identify the location of points of withdrawal or diversion for each right. If this information is provided in Chapter 1, *Description of Water System*, it does not need to be repeated here. Reference to the appropriate page where this information is presented is adequate. For surface water and springs, identify the names of all sources and the location of all intakes. For ground water, identify the well locations and depths.
- **Purpose Of Use** - Identify the purpose of use (e.g. domestic water supply, industrial use, etc.) as defined in the water right, and discuss any changes which have occurred regarding purpose of use.
- **Place Of Use** - Describe and provide a map or metes and bounds description of the following: 1) place of use as described in water right permit/certificate/claim; 2) future service areas identified; 3) existing service area where water is served either directly or via wholesale connections to other purveyors; and 4) if located in an area covered by the Public Water System Coordination Act, (RCW 70.116), the place of use/service area(s) described in the regional supplement to the coordinated WSP.

Existing service areas (where water is currently provided) must be covered within place of use descriptions in water rights. If existing service areas are not covered by water right place of use descriptions, immediate actions to ensure compliance with such water right parameters must be identified and carried out. Where possible, future service areas and water right place of use descriptions should be consistent.

- **Time Of Use** - Describe time of use limitations, if any.
- **Provisions Or Limiting Conditions** - Identify all provisions or conditions which were placed on water right documents.

Instructions for Defining Water Right Permit or Certificate Parameters (Tables 3 and 4)

Under the state water code (1917 for surface water and 1945 for ground water) water can only be put to use once a person has obtained a water right permit from Ecology. (Note: some small uses of ground water are exempted from the permitting process.) Once water has been put to use, in accordance with the conditions of the permit, a certificate of water right is issued. The information requested here should, in most cases, be included on either the permit or certificate. If you have questions on these parameters, contact the local Ecology regional office in your area.

1. **Permit or Certificate Number:** In most cases, this is the number which is assigned by Ecology upon receipt of an application for a water right permit, (it differs on older water rights). It is listed at the very top of the permit or certificate form.
2. **Name of Rightholder:** This is generally the name of the person that originally obtained the water right permit or certificate. Unless it has been subsequently updated, it may differ from the name of the current rightholder. Use the name listed on the permit or certificate despite the fact that it may no longer be current.
3. **Priority Date:** This is the date that is listed at the very top of the permit or certificate form (next to the permit or certificate number).
4. **Source Name/Number:** Many water right permits and certificates are for multiple sources, please identify the individual sources used (e.g. well #1, well #2, etc.) as defined on water right documents. Use separate line for each source.
5. **Flow Rate (Qi):** This is the amount of water which can be taken from this source during a period of peak operation. For surface water, the flow rate is generally expressed in terms of cubic feet per second (cfs). For ground water, the flow rate is generally expressed in terms of gallons per minute (gpm). One cfs equals 448.8 gpm. Please indicate the units of measurement you are using for each source. Any situations where the flow rate allowed in the permit will be limited (e.g. limitations established when other sources are utilized) must be noted.
6. **Annual Quantity (Qa):** This is the amount of water which can be taken from the source on an annual basis. It is almost always expressed in terms of acre-feet. An acre-foot is the amount of water necessary to submerge an acre of land to a depth of one foot. One acre-foot equals 43,560 cubic feet or 325,851 gallons of water.

7. **Primary Or Supplemental:** Indicate whether a particular source is for primary or supplemental use. This information is generally listed in the “quantity, type of use, period of use” section on both permits and certificates. If it is not, you will need to understand how your system operates to explain how each source is used in conjunction with others.
8. **Water Obtained Through Interties:** Water obtained through interties with other purveyors (i.e. where water rights are held by a separate purveyor) for non-emergency supply purposes must also be accounted for. This is necessary to ensure that all supply sources are considered when evaluating the need for new water rights. Please identify the maximum volume of water that is allowed for purchase through such interties. Where limiting conditions or temporary intertie agreements exist that effect the long term use of such supply sources, purveyors must account for such limiting conditions when evaluating existing and long term water right needs (additional information on interties is requested in Section 5 of this chapter). Finally, purveyors who received water through an intertie are responsible for ensuring that the underlying water rights for water purchases through such an intertie are adequate for such use. This includes ensuring that place of use descriptions in such water rights authorize the distribution of water through the intertie.

Instructions for Defining Water Right Claim Parameters (Tables 3 and 4).

Registered water right claims are claims to water rights which existed prior to the state water code (1917 for surface water and 1945 for ground water). They were filed in compliance with Chapter 90.14 RCW and, with some limited exceptions, had to be filed on or before June 30, 1974. Two forms were used for filing claims: a long form which requested considerable specific information and a short form which requested minimal information. Depending upon which form was used, you may need to do additional research to provide some of the information requested. If you have questions on these parameters, contact the local Ecology regional office in your area.

1. **Registered Claim Number:** This is the registration number which is stamped in the lower left hand corner of the claim form.
2. **Name of Claimant:** This is the name of the person that filed the claim. The name on the claim may differ from the name of the current rightholder. Use the name listed at the top of the claim form (line 1 of the long form) despite the fact that it may no longer be current.
3. **Priority Date:** This is the date that the use of the claimed right was initiated. It should be listed on line 4 of the long claim form (was not requested on the short form).
4. **Source Name/Number:** Many single registered claims are for water from more than one source. If any claims are for multiple sources, please identify the individual sources used (e.g. spring #1 or bubbling spring, spring #2, etc.).
5. **Flow Rate (Qi):** This is the amount of water which can be taken from this source during a period of peak operation. It should be listed on line 3.A of the long claim form (it was not requested on the short form). For surface water, the flow rate is generally expressed in terms of cubic feet per second (cfs). For ground water, the flow rate is generally expressed in terms of gallons per minute (gpm). One cfs

equals 448.8 gpm. Please indicate the units of measurement that you are using for each source. Any situations where the flow rate allowed in the claim will be limited, (e.g. limitations established when other sources are utilized), must be noted.

6. **Annual Quantity (Qa):** This is the amount of water which can be taken from the source on an annual basis. It should be listed on line 3.B of the long claim form, (it was not requested on the short form). It is almost always expressed in terms of acre-feet. An acre-foot is the amount of water necessary to submerge an acre of land to a depth of one foot. One acre-foot equals 43,560 cubic feet or 325,851 gallons of water.
7. **Primary Or Supplemental:** Indicate whether a particular source is for primary or supplemental use. This information was not requested on either claim form, so you will need to understand how your system operates to explain how each source is used in conjunction with others.
8. **Water Obtained Through Interties:** Water obtained through interties with other purveyors, (i.e. where water rights are held by a separate purveyor) for non-emergency supply purposes must also be accounted for. This is necessary to ensure that all supply sources are considered when evaluating the need for new water rights. Please identify the maximum volume of water that is allowed for purchase through such interties. Where limiting conditions or temporary intertie agreements exist that effect the long term use of such supply sources, purveyors must account for such limiting conditions when evaluating existing and long term water right needs (additional information on interties is requested in Section 5 of this chapter). Finally, purveyors who received water through an intertie are responsible for ensuring that the underlying water rights for water purchased through such an intertie are adequate for such use.

Water Rights, Current Water Usage and Projected Needs

In addition to providing the above information in Tables 3 and 4, purveyors must also compare existing water rights, current water use (see Table 3) and projected 20 year water demand (see Table 4) to identify any water right modifications needed. Water use data and water demand projections developed in Chapter 2 should be utilized to define current water usage and projected water needs. Based upon the comparison of existing water rights, current water usage, and projected 20 year water needs, purveyors must determine whether additional water rights are needed. If new or modified water rights appear to be necessary within the next 20 years, purveyors must estimate when new sources must be on-line and when water right permit approvals will be sought. If existing water rights are not adequate, efforts must be identified to secure additional rights to ensure a safe and reliable water supply.

Water Reservations

All water reservations granted by Ecology should be identified. Pertinent details, such as the location, volume, conditions of use, restrictions, provisions, and other appropriate information regarding the reservation should be included. Additionally, discuss any plans to utilize the reservation.

Table 3 Existing Water Right(s) Status

Permit Certificate or Claim #	Name of Rightholder or Claimant	Priority Date	Source Name/ Number	Primary or Supplemental	Existing Water Rights		Existing Consumption		Current Water Right Status (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates										
1.										
2.										
3.										
4.										
Claims										
1.										
2.										
3.										
4.										
TOTAL	*****	*****	*****	*****						
Intertie Name/Identifier		Name of Purveyor Providing Water			Existing Limits on Intertie Water Use		Existing Consumption Through Intertie		Current Intertie Supply Status (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.										
2.										
3.										
4.										
TOTAL		*****	*****	*****						
Pending Water Right Application	Name on Permit	Date Submitted	Primary or Supplemental	Pending Water Rights						
				Maximum Instantaneous Flow Rate (Qi) Requested		Maximum Annual Volume (Qa) Requested				
1.										
2.										
3.										
4.										

Table 4 Forecasted Water Right(s) Status

Permit Certificate or Claim #	Name of Rightholder or Claimant	Priority Date	Source Name/ Number	Primary or Supplemental	Existing Water Rights		Forecasted Water Use From Sources (20 Year Demand)		Forecasted Water Right Status (Excess/Deficiency - 20 Yr Demand in Water Right)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
Permits/ Certificates										
1.										
2.										
3.										
4.										
Claims										
1.										
2.										
3.										
4.										
TOTAL	*****	*****	*****	*****						
Intertie Name/Identifier		Name of Purveyor Providing Water			Existing Limits on Intertie Water Use		Existing Consumption Through Intertie		Current Intertie Supply Status (Excess/Deficiency)	
					Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)	Maximum Instantaneous Flow Rate (Qi)	Maximum Annual Volume (Qa)
1.										
2.										
3.										
4.										
TOTAL	*****	*****	*****	*****						
Pending Water Right Application	Name on Permit	Date Submitted	Primary or Supplemental	Pending Water Rights						
				Maximum Instantaneous Flow Rate (Qi) Requested		Maximum Annual Volume (Qa) Requested				
1.										
2.										
3.										
4.										

4. Water System Reliability Analysis

The purpose of the water system reliability analysis is to summarize efforts being undertaken to ensure an adequate quantity of water can be provided at all times. When water shortages or interruptions in service occur, public health can be threatened because customers may use other non-potable sources of water inappropriately, or system pressure may be reduced such that basic public health needs are not met or other back flow related problems occur.

Several actions may be taken by a purveyor to reduce the risk of water shortages and to plan for activities which can be taken when water shortages do occur.

Summary of System Reliability Efforts

Provide a narrative explanation/overview of purveyor efforts related to the three components of system reliability identified below.

Source Reliability: Provide a general evaluation of the ability of the aquifers and/or surface sources to provide for the water demands of the system. Include a summary of both water quality and water quantity related reliability efforts. For water quality include a summary of: applicable studies completed or planned for completion; wellhead and water quality protection efforts, (see Chapter 5, *Source Water Protection*); and other appropriate information. For water quantity include a summary of: applicable studies completed or planned for completion; aquifer tests conducted; trends recorded related to ground water levels and/or surface water levels; overview of major new source development activities in the area that may impact source reliability; new actions planned to further increase aquifer/source reliability, if appropriate; and other applicable information.

If the system relies on an intertie with another water system for non-emergency water supply, include an evaluation of the following information as it relates to being able to provide a reliable source of water on an ongoing basis: any limitations placed upon the volume of water that is available through the intertie; any time limits which the water provider has placed upon providing such water; where water will only be provided for a specific time period, explain how long term water sources will be obtained to provide for current and projected water use; and other information related to the intertie agreement or facilities that may impact system reliability.

Water Right Adequacy: Include a brief narrative summary of water right permits, certificates, and claims held and their ability to reliably meet system water demands. The water right analysis conducted in this chapter should provide the necessary information. A reference to the appropriate page of the water right analysis is acceptable if such a summary is provided. Include an overview of all temporary, interruptible, seasonal, and supplemental water rights and explain how the restrictions associated with such rights do not undermine system reliability (i.e. how permanent rights or permanent rights in conjunction with these limited rights, fulfill system needs). If other purveyors provide water through an intertie, include a discussion of the water right reliability of the wholesale provider as it relates to the water provided through the intertie. As noted in Chapter 2, purveyors must begin to plan for new source development and new or expanded water rights when demand forecasts indicate that additional water rights will be needed within twenty years. Notwithstanding the twenty year planning requirement, systems are

encouraged to plan for and pursue water rights for longer increments, where appropriate. Some water development projects are very complex and time consuming. This should be considered when pursuing new water rights. Planning for new source development and water rights well in advance of actual needs will help purveyors ensure that they can develop new sources and, therefore, will enhance system reliability.

Facility Reliability: Provide a brief narrative overview of the findings from the system analysis conducted in Chapter 3 as it relates to facility reliability. If such an overview is included in Chapter 3, reference to the appropriate page is adequate. Systems should begin to plan for facility expansions when demand forecasts indicated that such expansions will be needed within 20 years. Systems should also plan well in advance for major system maintenance and replacement projects. Finally, include an overview of fire flow requirements for the purveyor and how they are being met.

Water Shortage Response Planning

Emergency response planning is a key component of overall water system reliability. This includes development of a contingency plan that identifies procedures for making emergency water available to customers. In addition to developing an emergency response program, purveyors must also develop a water shortage response plan detailing actions that will be taken during various levels of water shortage. During minor water shortages, only public information and voluntary conservation measures may be necessary to ensure adequate water supply. During extreme shortages, mandatory curtailment and rationing may be required.

Having a water shortage response plan in place will provide purveyors with an established plan on how to address shortages. It will also assist customers in understanding what they can do to reduce water usage and what to expect if the shortages become more severe. Water shortage response plans should include a process for problem assessment, identification of options to address problems, and implementation of specific actions that are dependent upon the severity of the water shortage. Please refer to the DOH publication *Guidelines for the Preparation of Water Shortage Response Plan* to determine specific requirements. This plan should be disclosed to purveyor's customers as part of the larger customer information effort discussed in the *Introduction*.

Purveyors may be required to update their WSP if mandatory water use curtailment is executed in a manner that threatens public health, as determined by DOH. DOH will make such determinations based on an assessment of weather/precipitation patterns, levels of curtailment implemented, frequency of curtailments, public health risks associated with such curtailment, and other appropriate site specific factors. The purpose of such an update would be to reevaluate the adequacy of water sources, assess alternatives for improving reliability and water use efficiency (update conservation plan and source of supply analysis) evaluate the need for additional water rights, and undertake other appropriate evaluations

Monitoring Well Levels

As part of ensuring water system reliability, purveyors with ground water sources are required to have a monitoring program for well levels. The purpose of such monitoring is to provide the purveyor the ability to determine if, and the extent of, any trends that show decreased capability of an aquifer, or a specific well, to provide water for utility services on an ongoing basis. At a minimum, water levels should be taken and recorded once during peak use season (typically July through September) and once during off peak use (typically December through February). Monitoring should occur during the same months each year to more accurately identify long term trends. The purpose of such monitoring is to ensure that aquifers are not being depleted by overuse and to help ensure that new withdrawals in the area are not depleting the aquifer. These water levels must be monitored over extended periods of time and reported as part of the WSP. Any trends should be noted and explanations included.

5. Interties

Interties can be important components of systems' water supply strategies, can increase system reliability, and may be viable sources for new water supply where new source development is contemplated. In this section, identify existing interties and any proposed interties. If existing interties are already discussed in Chapter 3, *System Analysis*, a reference to the appropriate page describing existing interties is adequate. Proposed interties should be discussed in Chapter 8. If the discussion in Chapter 3 and Chapter 8 includes all details required below, a reference to the appropriate page describing the proposed intertie is adequate.

Existing Interties

Existing interties, which are adequately recognized in water right permits, certificates, or claims, must be identified along with the following information for each intertie:

- Location of the intertie;
- Dates of its first use;
- Purpose, physical capacity, service area, and current use; and
- Intertie agreement of the parties and service areas assigned.

If no written intertie agreement exists, provide a description of when such an agreement.

New Intertie Proposals

Proposals for new non-emergency interties must be incorporated into all affected purveyors' WSPs. Information which must be identified, for each proposed intertie, includes the following:

- Location of the proposed intertie;
- Date it is proposed to be utilized;
- Purpose, physical capacity, service area and proposed usage;
- Demonstration of the installation of a source meter to measure water exchanged;

- Evaluation of intertie as it relates to existing and proposed water rights;
- Description of how the proposed intertie:
 - Improves overall system reliability;
 - Enhances the manageability of the system;
 - Provides opportunities for conjunctive use; and
 - Delays or avoids the need to develop new water sources;
- Copy of the intertie agreement between purveyors;
- Identification of any potential public health or safety concerns;
- Discussion of any water quality and treatment issues;
- Demonstration of the source capacity and hydraulic capacity of the supplying and receiving systems; and
- Identification of alternative sources that will be utilized when the intertie agreement expires if the water is not being provided in perpetuity.

Proposed new interties must be included in Chapter 8, *Improvement Program*. Additionally, the WSP and/or CWSP must be submitted to both Ecology and DOH for review of the intertie portion of these plans. WSP's, which include an intertie proposal, will be routed to Ecology for review.

Prior to construction, new interties must be approved, by DOH, via the project report or construction document approval process. DOH may approve plans containing intertie proposals prior to Ecology's decision on water right changes. However, construction documents on the intertie shall not be approved until Ecology issues the appropriate water right document to the applicant consistent with the approved plans.

For interties proposed/used for emergency purposes only include the following:

- Copy of the intertie agreement detailing conditions and limitations of use of such intertie;
- Description of the intended use of the emergency intertie;
- Location of the proposed intertie;
- Date the intertie is intended to be operational; and
- Hydraulic analysis conducted to identify the impacts upon each system.

Intertie Agreements

Intertie agreements should include the following:

- Discussion on place of use as authorized in water rights documents;
- Identification of specific time periods in which water will be provided;
- Identification of the volume of water available for use, including any seasonal or other restrictions;
- Identification of how water conservation programs, data collections, water demand forecasting and other operational matters will be coordinated; and
- Other department required information

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Chapter 5

Source Water Protection

Objective

The objective of this chapter is to develop a program to protect, and if possible, improve, source waters used by public water systems. This is accomplished by identifying, monitoring, limiting and controlling (to the extent feasible), all facilities and activities within the watershed or zone of contribution which may adversely impact source water quality. Source water protection for Group A systems is required under WAC 246-290-135, -668 and -690.

Plan Content

Source water protection takes different forms depending on whether a source of supply is surface water or ground water. Purveyors must prepare a wellhead protection program and/or a watershed control program, as applicable.

If the utility uses ground water, a wellhead protection program is required. A watershed control program is required for utilities using surface water. Ground water sources generally include properly sited and constructed wells, wellfields and springs. Ranney wells, infiltration galleries, springs and some wells (located near surface water bodies and meeting additional criteria) may be identified as “ground water under the direct influence of surface water” (GWI). Purveyors of systems using GWI sources may be required to implement a combination of both wellhead protection and watershed control program elements. DOH is responsible for making GWI determinations and will notify purveyors with potential GWI sources.

Some water systems have previously submitted wellhead protection and/or watershed control program plans for DOH review. DOH may have formally approved these documents or may have simply provided comments on their technical merits. Since these documents become dated and regulatory requirements change, these elements still need to be addressed in the WSP. However, in order to minimize time and expense incurred in developing the WSP, these documents may be included as an attachment or appendix to the WSP and the plan itself can focus on demonstrating compliance with the balance of the source water protection requirements.

1. Wellhead Protection Program

All Group A public water systems using wells or springs (excluding systems using purchased sources or interties) are required to develop a wellhead protection program. The information provided below highlights the WHP requirements. Refer to the *DOH Wellhead Protection Guidance Document* for further details.

The following elements are key components of any wellhead protection program. (Note: any activity that will be performed pursuant to the wellhead protection program should be included in Chapter 8, *Improvement Program*.)

Overview

Include a brief overview of how the program has been developed and implemented.

Susceptibility Assessment

A completed assessment or documentation that one has already been submitted to DOH must be included.

Wellhead Protection Area Information

A map and explanation of how and where the wellhead protection area(s) and zones were calculated and are located is necessary.

Contaminant Source Inventory

Purveyors are required to conduct an inventory of potential contaminant sources in their wellhead protection areas. They must identify past, present and proposed land uses that might pose a threat to the well or wellfield. This list of land uses must be updated at least every 2 years.

Notification of Findings

It is important that state and local agencies be notified of the wellhead protection program's findings including the wellhead area boundaries and the inventory data. It is expected that the agencies will use wellhead protection findings to:

- Help prioritize local and state pollution control outreach efforts;
- Provide incentives for risk reduction by the identified potential contaminant sources; and
- Be incorporated into local land use planning decisions.

Documentation that the appropriate regulatory agencies, local governments, and owners/operators of the identified known and potential contaminant sources have been notified of the wellhead protection area boundaries, inventory findings, and contingency plan conclusions is required. A discussion of the susceptibility ranking of the system, the meaning of that determination, and the number of persons served by the system should be included in all notification letters.

Contingency Plan

A contingency plan is required. It should address long term replacement of the current principal source of supply (e.g., major well(s) or wellfield), and the cost of developing the new source of supply. This documentation can be integrated with the other contingency planning efforts described in Chapter 6, *Operation and Maintenance Program*.

Spill Response Planning

The spill response plan must include: documentation of coordination with local emergency spill/incident responders (e.g., police, fire, and health jurisdictions); notification of WHPA boundaries; results of susceptibility assessment; inventory findings; and a contingency plan. This documentation can be integrated with the other emergency response planning efforts described in Chapter 6, *Operation and Maintenance Program*.

The following elements, although not required by WAC, should also be considered when developing a wellhead protection program:

Regional Implementation Efforts

If purveyors work together to implement a regional wellhead protection program, individual purveyors may submit the regional wellhead protection program documentation as the core of their individual wellhead protection efforts under the WSP. Sufficient detail should be included to document individual utility compliance with planning requirements.

Implementation Strategies

Public education is a very important part of managing wellhead protection areas. Once people understand that their activities might adversely affect the water they drink, they are more willing to change their practices.

An effective way to involve the public is to form a local wellhead protection committee. Members of the committee can include representatives of jurisdictions with land use controls over the wellhead protection area; water system purveyors; members of industrial, commercial, and agricultural organizations; citizen action groups, tribal representatives and regulatory agency personnel. The wellhead protection plan is more likely to become an effective, implementable program by involving members of affected groups from the beginning.

Wellhead Protection and the Waiver Process

Purveyors of Group A systems that apply for monitoring waivers for the Phase II/V regulated compounds are well on their way to also fulfilling the regulatory requirements of wellhead protection. Susceptibility assessments, wellhead protection area boundary establishment, and inventory of contaminant sources are principle elements of both programs.

Once steps are taken by purveyors to seek initial monitoring waivers, implementing the additional steps required under the wellhead protection program may help simplify the process for obtaining future monitoring waivers. In other words, systems with an on-going wellhead protection program should be better equipped to demonstrate that their drinking water is at a lowered risk of contamination. This demonstration may enable these systems to reduce future chemical monitoring requirements.

2. Watershed Control Program

Regulatory Requirements/Program Overview

Watershed control requirements apply to all Group A systems using surface water, (i.e. both filtered and unfiltered systems). A watershed control program is an integral part of a purveyor's overall strategy to ensure public health protection. The term “watershed” refers to the hydrologic drainage upstream of a utility’s surface water intake. The watershed affects the physical, chemical and microbiological quality of the source. For GWI sources, the wellhead protection program suffices as the watershed control program. Purveyors are encouraged to have an aggressive and detailed watershed control program to limit, manage or eliminate sources of contamination in their watersheds. (Note: any activity that will be performed pursuant to the wellhead protection program should be included in the improvement program schedule and budget.

Only a small number of systems using surface water sources meet the criteria to remain unfiltered under the Surface Water Treatment Rule (SWTR), which is detailed in Part 6 of Chapter 246-290 WAC. DOH's Drinking Water Program policy, *SWTR Implementation Policy - Minimum Watershed Control Program Requirements* details watershed control program requirements for systems remaining unfiltered. General information on watershed control and highlights of the watershed control policy for unfiltered systems are contained in Chapter 5 of DOH’s *SWTR Guidance Manual*. **The information provided in this section focuses on watershed control guidelines for *filtered* surface water systems. Unfiltered systems need to contact the DOH Regional Office to discuss watershed control requirements.**

In general, the scope of a watershed control program is expected to increase as the complexity and size of the watershed and/or system increases. Filtered systems must:

- To the extent possible, exercise surveillance over conditions and activities in the watershed affecting source water quality; and
- Develop and implement a DOH-approved watershed control program (regardless of system size or complexity).

There are a number of approaches available to meet the watershed control program requirements. It is recognized that no two watershed control programs will be identical because of the uniqueness of each purveyor's watershed and system characteristics . The watershed control program must address, at a minimum, the following elements:

- Watershed Description/Characteristics;
- Identification of Activities/Land Uses Detrimental to Water Quality;
- Watershed Management and Control Measures;
- Monitoring Program; and
- System Operations.

The following briefly describes each of these elements:

Watershed Description/Characteristics

This section of the watershed control program should include:

- Geographical location/boundaries of the watershed; physical features of the watershed including size and ranges of elevation (include a topographical map delineating the watershed). Topographic map(s) such as the U.S. Geological Survey's 7 1/2 series maps may serve as the base map. Identify the state Water Resource Inventory Area (WRIA) identification number which corresponds to the major watershed in which the source(s) are located, as well as the watershed and waterbody names;

Note: If the source is located in the same watershed as the rest of the system, and if there is a WRIA number (other than "0") shown near the top of the WFI, that number should be used. The WRIA number may also be shown on the water right documents for the source. If not, ask the appropriate DOH regional office for a map and table to identify which WRIA identifies the system's watershed.

If a system's watershed is substantially smaller than the associated WRIA, the map should focus specifically on the system's watershed and not the entire WRIA.

- Hydrological information including historical precipitation data, annual precipitation patterns, streamflow characteristics (including maximum, average, and minimum flows), sediment loading as related to rainfall intensity, terrain/geologic features, vegetation and soil type. Any other watershed characteristics detrimental to water quality such as areas subject to erosion or slides should be described;
- Identification of critical areas (i.e. locations within the watershed where human or animal activity could degrade water quality at the intake). These are the areas that water systems often target for additional protection and/or control;
- Location of major water system components (intakes, reservoirs) in relation to the watershed; description of the physical condition of the intake and protection provided at the intake;
- Delineation of land ownership including a map, table, and narrative description; and
- Identification of key access points, if applicable. Map, describe and relate these to critical areas.
- Water quality and ongoing monitoring, including sampling locations.

Identification of Activities/Land Uses Detrimental to Water Quality

This section of the watershed control program should identify all activities/land use practices within the watershed which are currently impacting or which have the potential to adversely affect source water quality. Impacts to source quality may result from physical (turbidity), microbiological (including sources of *Giardia*, *cryptosporidium* and viruses) and chemical sources of contamination. A map, table and narrative description should be provided to identify and locate such activities/land uses occurring within the

watershed and describe their potential impact on source water quality. A brief history of activities and development in the watershed should also be included.

Both naturally-occurring conditions and/or events as well as human sources of contamination and/or activities should be considered. Both point and non-point sources of contamination should also be identified. Conditions and/or activities should be prioritized in terms of their potential to degrade source quality.

The following conditions/land use practices should be considered in the discussion as applicable:

- Residential land uses especially areas served by on-site wastewater treatment systems;
- Agricultural land uses and associated soil erosion and chemical usage (pesticides, herbicides);
- Concentrated animal operations, (e.g. dairies, feedlots, chicken farms, pig production, fish hatcheries);
- Grazing operations;
- Timber management, including road construction/repair and fire prevention/control;
- Municipal/commercial land uses including wastewater treatment plant discharges and sewer lines;
- Industrial land uses including industrial discharges;
- Recreation (e.g., fishing, boating, swimming, hunting);
- Fish and wildlife populations;
- Transportation routes;
- Hydroelectric power generation;
- Flood control;
- Mining;
- Research and education; and
- Proposed land use changes that could adversely impact water quality.

Watershed Management and Control Measures

This section of the watershed control program should detail how the system monitors and controls activities and land uses (identified in the previous section) to minimize or eliminate adverse source quality impacts. The discussion should include an evaluation of existing watershed control measures and their effectiveness. Any deficiencies in current control measures should be noted. In addition, the program should discuss the potential effectiveness and feasibility of implementing in the future various new strategies and specific measures for improving watershed control. The discussion should primarily focus on those control measures which can be implemented by the purveyor. Primarily the program should include specific recommendations to improve watershed control. The

program should prioritize the recommended control strategies and measures in terms of effectiveness and outline a schedule for their implementation.

Some purveyors are able to employ strict watershed controls through direct ownership control of key areas and/or control of activities on the watershed through written agreements. The program should identify any efforts already taken or planned by the utility to secure ownership of the watershed, particularly key areas and areas providing access to water system facilities. Such efforts may include resources devoted to land purchases, arrangements with non-utility landowners for land swapping, etc. In addition, written agreements to control human activities on non-utility owned land should be documented and copies of such agreements included in the program.

Purveyors may be able to exert some control over watershed activities and land use practices through normal governmental planning procedures. The watershed control program should describe the utility's involvement in local and regional government planning processes. The level of watershed control which is currently achieved or is expected to be achieved in the future through governmental planning efforts should be described.

Most purveyors will use a combination of control measures in different categories to achieve watershed control. Examples of various watershed control measures which may be used by purveyors include, but are not limited to:

A. Land Ownership/Written Agreements

- Complete ownership of watershed, ownership of key areas and/or control of key access points;
- Formal, written agreements with other landowners; and
- Informal agreements with other landowners.

B. Land Use Restrictions

- Prohibiting certain land uses/activities;
- Posting watershed boundary and imposing watershed entry restrictions;
- Restricting reservoir use;
- Requiring stream buffer strips;
- Requiring reservoir buffer strips; and
- Imposing land use restrictions including official, specific land use and development restrictions enforced by local or state agencies.

C. Regulation of Agriculture, Timber Harvesting and Construction Practices

- Requiring use of Best Management Practices (BMPs) by farmers and foresters in the watershed;
- Eliminating, minimizing and/or controlling the type, location and amount of fertilizers, herbicides and pesticides used in watershed; and

- Regulating construction practices to minimize adverse impacts on source water quality.

D. Inspection, Surveillance and Monitoring Programs

- Providing inspectors to monitor impacts of activities (e.g., as timber harvesting and/or road construction) occurring within the watershed;
- Implementing watershed surveillance programs including security patrols to routinely check for trespassers at the headworks, reservoirs, other utility facilities, etc. and other parts of the watershed with emphasis on key areas;
- Monitoring water quality of tributaries, the primary surface supply and reservoirs; and
- Conducting special monitoring programs to document trends in source water quality, to determine the adverse impacts of various activities and land uses in the watershed, and to indicate the effectiveness of various control strategies and measures.

E. Contamination Source Controls

- Managing forest health to reduce the potential for catastrophic fires;
- Careful planning, construction and maintenance of roads, including rehabilitation and deconstruction, where needed;
- Eliminating or imposing controls such as industrial/municipal discharge permits to minimize the impacts of point source discharges as required by law;
- Requiring stormwater to be collected and treated;
- Requiring septic tank inspection and permitting programs;
- Monitoring and controlling wildlife access to the area immediately upstream from and around the intake; and
- Stabilizing areas prone to erosion and/or slides, and rehabilitating stream banks and slide areas.

F. Public Education

- Conducting educational outreach programs; and
- Forming a local watershed control committee.

Monitoring Program

This part of the watershed control program should contain a detailed description of the program the purveyor uses to monitor adverse water quality impacts from the activities occurring within the watershed; and source water quality. The program should describe how the purveyor uses the results of the monitoring program to assess the adequacy of watershed protection and control.

The program should identify specific activities (logging, road construction, hunting, etc.) and extraordinary circumstances (floods, chemical spills, etc.) of concern to the purveyor. The parameters monitored, frequency of sampling, and specific sampling locations for each activity should be described. The purveyor's routine water quality monitoring program should also be described including parameters monitored, sampling frequency, and sampling locations. Any special monitoring programs or sampling (seasonal, *Giardia*, *cryptosporidium*, etc.) conducted within the watershed should be described.

A summary of the source water quality data (physical, microbiological, chemical and radiological) must be provided to document water quality trends. This data should be evaluated for trends which show changes in the water quality over time. Where possible, water quality trends should be evaluated for any correlation with the land use/activities/watershed conditions identified previously and as a means of indicating the effectiveness of various watershed control strategies and specific control measures. Results of the water quality evaluation should be discussed and any deficiencies in the existing monitoring program should be identified. The monitoring program should discuss recommendations for improvements in the monitoring program and include an implementation schedule.

System Operations

The watershed control program should address system operations to ensure that the water delivered to customers continuously meets the SWTR and other drinking water regulations. The program should provide a schematic which locates key system components. The program should describe system design and operational and treatment flexibility and be able to adjust for changes in source water quality and/or watershed emergencies. If this information was documented in Chapter 3 *System Analysis*; it can be referenced here.

This section should contain detailed information related to the utility's emergency response program to detect and address emergencies in the watershed such as landslides, forest fires, floods, toxic spills, and wastewater treatment plant failures. The system operations program should describe and evaluate the effectiveness of early warning systems/alarms for detection of watershed emergencies. Appropriate responses to various watershed emergencies may take the form of modifications to treatment plant operations to address higher than normal turbidity levels and/or provide increased levels of disinfection.

The discussion should include information regarding what triggers emergency response operations procedures for watershed emergencies and who is responsible for emergency response decision-making. This information should be integrated with the purveyor's emergency response plan outlined in Chapter 6, *Operation and Maintenance Program*.

Systems that rely on alternate sources for use during watershed emergencies should provide:

- Evidence that they have been issued the water right permit by Ecology for the alternate source(s); and
- Information to show that the alternate source(s) has the capacity to meet system needs until the primary surface source can be put back on-line.

Contact the appropriate DOH regional office for specific conditions and procedures for placing emergency sources into service. Emergency response procedures must include provisions for DOH notification.

Periodic Watershed Evaluations/Updates

Purveyors of filtered systems must conduct periodic comprehensive evaluations of their watersheds and to update their watershed control programs. Watershed evaluations must be conducted at least every 6 years, so that the watershed evaluation results can be included in the purveyor's updated WSP. Purveyors must update their watershed control programs (and respective comprehensive WSPs) based on the results of the watershed evaluation.

Results of the watershed evaluation must be summarized in a report. The watershed evaluation report must contain a summary of basic watershed program information such as described in the previous sections. The report must also describe, and primarily focus on, the following:

- Conditions/activities which are adversely impacting source quality.
- Changes in the watershed that have occurred since the last watershed evaluation, including changes in conditions, activities or sources of contamination which could adversely impact source water quality. Address any anticipated future changes, and the strategies the purveyor is currently using or is planning to use to control and/or minimize the impacts of the changes on source quality.
- The monitoring program the purveyor uses to assess the adequacy of watershed protection. Address any changes, since the last watershed survey, in the activities monitored, frequency of sampling, parameters monitored, sampling locations, and any special (seasonal, *Giardia/cryptosporidium*) sampling conducted within the watershed. Identify deficiencies in the existing monitoring program should also be identified. Discuss recommendations for improvements in the monitoring program.
- Include a summary of source water quality monitoring data (physical, microbiological, chemical and radiological), and an evaluation of data trends which show deterioration or improvement of the water supply. Where possible, evaluate water quality trends for any correlation with the activities/conditions identified under either of the first two bulleted items above.
- The purveyor's current watershed control strategies and an assessment of their effectiveness in protecting the quality of the source. Address recommendations for improved watershed control, including a discussion of priorities, the feasibility of any recommended corrective measures, and include an implementation schedule.

Additional Considerations

The number of watershed control programs that a purveyor is required to develop is dependent on the number of surface sources in use and their respective locations. In general, if a system has:

- Multiple surface sources in the same watershed, the purveyor should develop one watershed control program.
- Multiple surface sources in different watersheds, a separate watershed control program should be developed for each watershed.

The comprehensiveness of the watershed control program and the level of detail in the watershed control program will vary based on utility size, watershed characteristics, current/projected activities and land uses within the watershed and possibly by the type of treatment provided by the utility (some technologies require higher water quality sources to provide effective filtration). The level of detail of the watershed control program should be determined during a preplanning conference with the regional planner and engineer from the appropriate DOH regional office. Watershed control program format is up to the discretion of the utility.

It should be noted that much of the information required for developing a watershed control program may be readily available for systems which have completed the Surface Water Checklist as part of the Phase II/V monitoring waiver package.

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Chapter 6

Operation and Maintenance Program

Objective

The objective of the operation and maintenance program is to assure satisfactory management of water system operations in accordance with WAC 246-290-100, -300, -310, -320, -440, -480, and -490; WAC 246-292-020, -050 and -090.

Plan Content

Each water system must have a program for proper and efficient operation and maintenance. The program should assure that improvements identified in the WSP will be properly operated and maintained. Implementation of a sound operations program should enable the utility to consistently provide reliable, high quality drinking water to its customers.

Ideally, the operations program should be a stand-alone document that clearly outlines the day-to-day functions involved in keeping the system running smoothly. By carefully documenting what it takes to successfully operate and maintain the system, this manual can be used in the event that operation of the utility changes hands.

An accurate assessment of the system's operation and maintenance can help the purveyor predict financial and construction needs. For example, by identifying how many personnel-hours it is presently taking to run the system, questions such as, "Can the operation be streamlined?", or "Do we need to hire more personnel?", can be answered. Identified costs need to be included in the financial program.

Purveyors are encouraged to develop an operations program that provides the level of detail needed to adequately operate the water system. **The utility should take the lead in developing this program rather than their consultant. It is important to obtain input from operations staff, as their on-the-job experience is a valuable source of information.**

An operation and maintenance program should contain the following 10 major elements:

1. Water System Management and Personnel;
2. Operator Certification;
3. System Operation and Control;
4. Comprehensive Monitoring (Regulatory Compliance) Plan;
5. Emergency Response Program;
6. Safety Procedures;
7. Cross-Connection Control Program;
8. Customer Complaint Response Program;
9. Recordkeeping and Reporting; and
10. O&M Improvements.

The operations program should include a discussion of the current status of operations for each element or a description of planned operations, along with a schedule for

implementation. A specific program is expected, **not** a list of suggestions. Chapter 8, *Improvement Program*, should include the major recommended operation improvements.

1. Water System Management and Personnel

A description of the decision-making "chain of command" should be provided. For larger systems, an organizational chart showing the water system management, operation, and control structural hierarchy needs to be included. The major responsibilities for each position shown on the organizational chart should be listed.

The positions responsible for the following functions should be documented (as a minimum):

- Normal day-to-day operations;
- Preventative maintenance;
- Field engineering;
- Water quality monitoring;
- Emergency response;
- Cross-connection control;
- Implementation of the improvement program;
- Budget formulation;
- Response to complaints;
- Public/press contact; and
- Billing

It is important to note which activities must be done by specifically qualified and licensed/certified personnel to assure compliance with applicable rules.

2. Operator Certification

Certain utilities must have one or more certified operators. The operations program should include a description of the positions affected by the certification regulation, level of certification required, and current status in meeting the requirement. It is important to document the utility's commitment to support ongoing training to ensure that their certified operator(s) comply with professional growth requirements.

3. System Operation and Control

It is important to fully understand how the water system operates. This element should include the following:

Identification of Major System Components

- Identify each major system component on a map, (see Chapter 1, *Inventory of Existing Facilities*);
- Describe the normal operation of the component;
- Describe each component's relationship with other system components under normal operating conditions; and

- Describe possible alternate operation modes and circumstances under which they would be used.

Routine System Operation

For each major system component, describe the routine operational tasks that are performed and controlled. It is useful to lay out routine system operations in a calendar chart format describing daily, weekly, monthly, and annual activities for each system component.

Include the following:

- Start-up and shut-down procedures;
- Safety procedures;
- Meter reading; and
- How system performance is evaluated.

Preventative Maintenance Program

For each major system component, describe the preventive maintenance tasks (if any) that are performed. List:

- Type of preventative maintenance or inspection required;
- Frequency of maintenance or inspection; and
- Any extraordinary changes to operations which would occur when a facility is off-line/unavailable, (e.g. reservoir off-line for cleaning or recoating).

Equipment, Supplies and Chemical Listing

An equipment, supplies and chemical listing should be maintained at all times. Include the following items:

- All equipment, supplies, and chemicals used by the water system;
- Service representatives for major water system components and chemical suppliers;
- Manufacturers' technical specifications for major system components and chemicals used (these may be referenced); and
- Stock of supplies and chemicals needed to assure continuous operation of the water system.

4. Comprehensive Monitoring (Regulatory Compliance) Plan

Purveyors are required to sample their system's sources at representative locations within their distribution systems to determine the adequacy of public health protection provided to customers. Sampling requirements are primarily established by federal rule and adopted by the State. The rules define the parameters which must be monitored, the generalized description of sample site locations, and the schedule for initial and routine sampling. Sampling requirements are based on the populations served by the water system as well as the type of source(s) used.

Since the passage of the 1986 amendments to the SDWA, requirements have become increasingly complex for both source and distribution sampling. The SDWA was further amended in 1996. In order for purveyors to understand and comply with their monitoring obligations, a comprehensive regulatory compliance plan for all water quality parameters must be developed and followed.

Water quality monitoring is required for the source(s) and the distribution networks. These respective aspects of utility operation must be considered in developing a monitoring program. For a few parameters (such as coliforms), monitoring will be essentially the same from month to month or year to year. Most others will have changing requirements as monitoring progresses and a history of analytical results is generated which will help determine future monitoring requirements. Utilities may choose to conduct additional water quality monitoring beyond the minimum required by rule. **Please note that DOH has a program allowing waivers for some source monitoring requirements, provided certain specific conditions can be met.** As with routine operations it may be useful to lay out the monitoring program in a calendar chart format.

This section must address all water quality parameters which are required under current state regulations. It must also address those that are described in federal rules but which have yet to be adopted by the state. Generalized classification of water quality parameters include microbials, inorganics, organics, and radionuclides. Each of these categories contain parameters for which the monitoring requirements are different.

The WSP must include specific monitoring plans associated with several of the regulatory monitoring requirements. These specific plans should be consolidated into one section descriptive of the comprehensive monitoring required of the water system. Contact the applicable DOH regional office for technical assistance in determining system specific monitoring requirements.

Comprehensive Monitoring Plan Elements

The comprehensive monitoring plan must describe the following for each portion of the system (i.e., source, distribution and treatment):

- The monitoring locations for each analytical parameter. If a monitoring location can not be in compliance with state or federal requirements, the rationale (and acceptance of that rationale by DOH) for use of an alternate site must be discussed;
- Schedules showing the monthly, annual, and long-term sampling needs for meeting regulatory monitoring requirements, based upon state and/or federal regulations, for **all** water quality parameters;
- Existing and anticipated waivers for the sampling requirements that have or may be granted by DOH;
- Description of any options that will alter sampling patterns such as compositing of source samples, where allowed, or a wellfield;
- Acknowledgment that certified laboratories, where appropriate, will be used to provide for analytical services for all required monitoring; including copies of contracts with laboratories which will analyze the samples, where applicable;

- Description of any special monitoring requirements imposed by DOH based on a public health concern;
- Projections of any future monitoring requirements that may need to be addressed by the water system in the next six years as a result of new regulation development by DOH or the Environmental Protection Agency.

Adjustments to Monitoring Programs

In some instances, a utility's monitoring program may be adjusted based upon the historical analytical results obtained through an existing, routine program. One example would be the need for an increase in coliform samples for the months following the finding of positive samples in any given month. Also, whenever a Maximum Contaminant Level (MCL) is exceeded for a primary contaminant standard, DOH may impose additional sampling requirements as follow-up actions. Another sample of when monitoring is waived, fully or partially, is based upon historical sampling results or whenever determined appropriate through DOH's waiver program.

The comprehensive monitoring plan should identify the potential sampling adjustments which must be, or may need to be, considered for all contaminants for which monitoring is required if an organic chemical detection or an MCL exceedance occurs as a consequence of the existing monitoring program.

5. Emergency Response Program

All Group A water systems are required to develop an emergency response program. The document, *Emergency Planning Workbook* (and accompanying *Instructional Guide*) was developed by DOH to assist utilities in developing their emergency response programs. DOH's *Guidelines for the Preparation of Water Shortage Response Plans* is also available from DOH regional offices. When developing the emergency response plan, purveyors may consider working with nearby water systems.

The emergency response section should include, at a minimum, the elements listed below:

Water System Personnel Emergency Call-up List

The list should identify, in ranked order, water system personnel responsible for making decisions in specific emergency situations. Job titles, phone numbers (work and home), and major water system responsibilities and expertise should be included.

Notification Procedures

Procedures for quickly notifying system customers, the public, the local health jurisdiction and DOH of water quality emergencies should be carefully documented. Include who would distribute a "boil water" order, if issued, and how they can be contacted after hours, weekends and holidays in case of emergencies.

Vulnerability Analysis

Purveyors must estimate the degree to which their water systems might be adversely affected in various emergency situations. Major facilities that are potentially vulnerable should be evaluated under a variety of emergency situations. Resulting system

weaknesses should be clearly identified. For very vulnerable facilities, building or installation of redundant facilities may be required. If so, they should be included in Chapter 8, *Improvement Program*. DOH's *Emergency Planning Workbook* and accompanying Instructional Guide contain a more complete discussion on vulnerability analysis.

Contingency Operational Plan

A contingency plan is a back-up plan for operating the system when normal operational procedures are not available. Contingency plans should be developed for each major, vulnerable facility identified in the vulnerability analysis. Procedures for making emergency water supplies available to system customers need to be specifically listed.

Particular attention should be given to describing conditions and procedures for putting standby (i.e. seasonal) and emergency sources into active service. This process includes ensuring water quality monitoring requirements are satisfied and treatment is provided, if necessary. It may also include procedures for notifying customers, the local health jurisdiction, and DOH of noticeable water quality differences (such as going from surface to ground water, or higher quality ground water to ground water sources with secondary contaminants that exceed maximum contaminant levels). Contact the appropriate DOH regional office for specific conditions and procedures regarding placing emergency sources into service.

The contingency plan as described here must be integrated with the wellhead protection requirement for contingency planning (see Chapter 5, *Source Water Protection*), and the water shortage response plan requirements (see Chapter 4, *Conservation Program, Water Right Analysis, System Reliability and Interties*).

6. Safety Procedures

The WSP should identify potential work place hazards for this water system (for example, chlorine and other water treatment chemicals, heavy equipment, and asbestos-cement pipe). Include special safety procedures that must be followed for each potential work place hazard, as well as Material Safety Data Sheets for each chemical. Safety and first aid equipment owned by the system must be documented, as well as safety training the utility's personnel have taken and are required to take. All appropriate Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Administration (WISHA) regulations must be followed.

7. Cross-Connection Control Program

Purveyors must develop and implement a cross-connection control program acceptable to DOH. The plan for this program is an integrated component of the system's operational program and must be included in the WSP.

The purpose of the cross-connection control program is to protect the purveyor's distribution system from the possibility of contamination due to existing or potential cross-connections. Purveyors are not responsible for abatement of cross-connections which occur within the customer's premises. Responsibility within the customer's premises falls

under the jurisdiction of the local administering authority (i.e., plumbing or building official) responsible for enforcing the Uniform Plumbing Code.

An acceptable cross-connection control (CCC) program must address the following elements:

1. Adoption of an appropriate ordinance, code or rule-of-service for the purveyor to establish the legal authority to implement the CCC program. The ordinance should further establish the authority for the source of funding to operate the program. A copy of the authorizing document(s) should be included in the appendices of the WSP.
2. Written procedures for implementing the CCC program including:
 - Determination of which department within the utility (for large utilities) will carry out the program and this department's relationship with other departments in the utility and with outside agencies;
 - A description of the process for developing cooperation and the mechanism for resolving conflicts between the purveyor, local building/plumbing, and other jurisdictions, where applicable, to ensure that public health is protected; and
 - Details of the program, such as :
 - priorities for conducting the system inventory;
 - consequences for failing to comply with the ordinance;
 - approval of qualifications for testers and specialists;
 - guidelines for assessing the degree of hazard;
 - guidelines for appropriate application of assemblies; and
 - standards for installation and testing of approved assemblies.
3. Identification of staff position delegated the responsibility for the organization and implementation of the CCC program. This person should be an experienced water works operator and have specific training through recognized courses and seminars in cross-connection control. Additional personnel within the utility should also receive cross-connection control training in order to serve as back-up to the primary responsible staff member. Small water systems should look to satellite management agencies, neighboring utilities or consider hiring a consultant cross-connection control specialist for back-up.
4. Establishment of the qualifications necessary for the personnel working in the CCC program.
5. Detailed procedures for conducting surveys of new and existing facilities to identify all existing and potential cross-connections which could result in contamination of the distribution system.
 - **New Construction.** The person responsible for the CCC program should review the application for new service, including the construction drawings. This review process should be followed by a survey of the facility once construction is complete. The purpose of the plan review and site visit is to

assess the degree of hazard and determine the appropriate level of protection for premise isolation.

- Existing Services. The procedures should include a list of all existing facilities by category, on a priority basis for surveying. The priorities should be based on the typical risk assessment of the various categories of facilities. Once the survey of a facility is complete, the purveyor should send the facility owner a report summarizing the survey findings.
6. Requirements that **only** approved backflow assemblies shall be installed at locations where cross-connection protection is required by the purveyor. Purveyors may contact DOH to determine how to obtain a copy of the most recent list of approved devices. The purveyor shall assess the degree of hazard at each location and require that an approved assembly appropriate to that degree of hazard, is installed.
 7. The establishment of a procedure or system to ensure that all backflow assemblies required by the purveyor are tested upon installation, after repair or relocation, and on a routine basis as established by state regulation. All testing must be performed by certified backflow assembly testers acceptable to the purveyor and the Department. (Purveyors may contact DOH for a current list of certified testers.) The test results shall be reported on a form acceptable to the purveyor.
 8. An adequate record system, specific to the CCC program. Such records should include, but not be limited to, a list identifying the location of all purveyor-required cross-connection control devices, the type of device, the testing schedule, the performance results, a description of repairs and/or recommendations for repairs made by the tester, and tester's name and certification number.
 9. A description of the methods or processes which will provide information (public education, etc.) regarding the CCC program to the existing and future system customers.

8. Customer Complaint Response Program

The system should maintain a list of complaints and identify what was done to respond to any complaints where public health was at risk. The WSP should provide a synopsis of the number and type of complaints along with the actions taken to respond to these complaints. The WSP should include a description of how the purveyor will notify customers regarding complaint response.

9. Recordkeeping and Reporting

Describe procedures for keeping and compiling records and reports, including the following items:

- A listing of records that are on file (e.g. water quality, consumption, and customer complaints),
- Where the records are filed,
- How long each type of record is kept on file (e.g. bacteriological analyses = 5 years); and

- Procedures for reporting required records to DOH.

10. O & M Improvements

Any improvements in the system's operation and maintenance program which will result in a financial impact must be evaluated and included in the improvement program, (see Chapter 8, *Improvement Program*).

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Chapter 7

Distribution Facilities Design and Construction Standards

Objective

The objective of this chapter is to describe and provide guidance for the inclusion of water system distribution facilities design and construction standards to enable the water purveyor to utilize an alternative approval process. By obtaining advance approval of design and construction standards (i.e., performance standards, sizing criteria, and construction materials and methods) along with an approved WSP, purveyors do not need to obtain written DOH approval of individual project reports and construction documents for distribution mains and other distribution-related facilities. The purveyor must still comply with all applicable sections of the regulations, including project report and construction document requirements listed under WAC 246-290-110 and -120, whether or not documents are submitted to DOH for approval. **The water purveyor should verify applicability for this submittal exception process at the preplanning conference or by contacting the DOH regional engineer .**

Types of distribution-related projects eligible under the alternative review process include distribution reservoirs/storage tanks, booster pump facilities, transmission mains, distribution mains, pipe linings, and tank coatings. Source of supply and water quality treatment projects are not eligible under this alternative review process. Such projects must be submitted to DOH for review and approval prior to construction. Source of supply projects refer to all work involving the development of a new source, redevelopment of an existing source at the wellhead, interties, and/or any project that would result in source capacity changes (i.e. either increase or decrease source production capability).

Design and construction standards must be based on DOH design guidance or other documents generally accepted by engineering professionals as containing fundamental criteria for design and construction of water utility projects. The water system standards must be at least as stringent as those discussed in Chapter 246-290 WAC and should not deviate from department design guidance unless adequately justified. Justification must include other acceptable industry standards, such as those referenced in WAC 246-290-200.

Plan Content

This portion of the WSP should address the following elements:

1. Project Review Procedures;
2. Policies and Requirements for Outside Parties;
3. Design Standards;
4. Construction Standards; and
5. Construction Certification and Follow-up Procedures.

This chapter of the WSP should contain information useful to a design engineer to prepare detailed construction plans and specifications. Detailed construction plans and specifications do not need to be presented as part of the WSP. If a purveyor has standardized detailed construction plans and specifications available, these may be included as an appendix or attached as a separate document. However, these plans and specifications are not required as a condition associated with utility-controlled distribution-related projects. Additional guidance is available from DOH on project report and construction document processing.

1. Project Review Procedures

Identify the process to be used for review of all project reports and construction documents. Review procedures must be consistent with state drinking water regulations, local ordinances, and any other applicable requirements. Emphasis should be placed on review procedures for distribution-related projects which will not be reviewed and approved by DOH.

Note: In order to be eligible for the submittal exception, this request must be received as part of the water system plan review application (a DOH form).

2. Policies and Requirements for Outside Parties

Address any policies or requirements for outside parties, such as developers, including right-of-way or pipe looping requirements or any other local or regional requirements. In particular, this section of the WSP should address minimum fire flow requirements, CWSPs, and level of service standards pursuant to GMA, as applicable.

Often, a purveyor will assemble a separate document that discusses all requirements for developer extensions. These documents generally include: application forms, general conditions, provisions for special circumstances, design standards, developer charges, and performance bonding. If a purveyor uses such a document it should be included in the WSP as an appendix or as a separate attachment.

3. Design Standards (Performance Standards and Sizing Criteria)

Identify the performance standards and sizing criteria to be used in designing each water system improvement. Performance standards are locally adopted criteria describing level of service and reliability, per WAC 246-290-420 under normal and emergency conditions, meeting reasonable customer expectations, and complying with applicable regulations. Sizing criteria is typically system specific and must be sufficient to ensure compliance with the minimum performance standards established in Chapter 246-290 WAC.

Performance standards and sizing criteria contained in other sections of the WSP should also be included in this chapter. This inclusion is particularly important when the design and construction standards are developed as a separate document or if the chapter is copied and handed out separately from the WSP.

Performance standards and sizing criteria should be system specific, with references to regulations, DOH design guidance and other standards where applicable. Performance standards should address both normal and emergency level of service. Performance standards and sizing criteria should include such elements as minimum pipe diameters,

maximum pipe velocity, minimum/ maximum distribution system pressures, storage tank sizing, and booster pump sizing.

4. Construction Standards (Materials and Methods)

Address construction materials and construction methods. Referencing general standards, such as the American Water Works Association (AWWA) or American Public Works Association (APWA) is not acceptable. Specific reference to the applicable individual standards should be made, such as “AWWA standard C900” or “...C905...” for PVC water piping, etc.

5. Construction Certification and Follow-up Procedures

Provide a description of the means by which the purveyor will assure that:

- 1) Projects are constructed in accordance with the water utility’s construction standards;
- 2) Construction inspection procedures, including pressure test procedures, if applicable, as well as disinfection procedures, and water quality sampling requirements have been properly performed; and
- 3) The procedures for preparation and retention of design and construction record drawings.

The WSP should also reference the requirement for completion of a Construction Report for Public Water System Projects, (a DOH form), per WAC 246-290-040.

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Chapter 8

Improvement Program

Objective

This chapter should develop an improvement program by incorporating the system needs identified in the previous chapters. All identified improvements need to be analyzed and prioritized, leading to development of the improvement program schedule. WAC 246-290-100 requires that systems identify their planned improvements in the WSP. DOH has the legal authority to order specific improvements in certain health-threatening situations pursuant to WAC 246-290-050.

Plan Content

The improvement program should include two basic elements:

1. Prioritizing of Improvements, (completed in the previous chapters); and
2. Improvement Schedule (completed here).

1. Prioritizing Improvements

The following three-step process should have been used in selecting improvements for each aspect of the plan. Water system improvements should not be limited to the construction of facilities. Any major studies or programs necessary to achieve the goals and objectives of the water utility should be included.

A. Identification of System Improvements

For each aspect of the system, analyze the system needs and develop a list of potential improvements to address those needs.

B. Assessment of Alternatives

The potential improvements identified in Step A need to be evaluated and prioritized. The following criteria may assist in this process. This list is not comprehensive.

Health Standards: Does the improvement option conform with and support all applicable health regulations and standards?

Land Use: Does the improvement option conform with and support adopted land use plans and policies?

Quantity: Does the improvement alternative result in an adequate amount of future water source?

Reliability: How much increased reliability does the improvement alternative provide the system? Is the system's desired level of reliability being achieved?

Costs: What are the initial and annual capital costs? What are on-going costs for operation and maintenance of the improvement alternative?

Regional Benefit: To what degree will the improvement alternative fulfill regional goals as well as individual system needs? Take into account regional water system needs and other multi-purpose benefits, such as flood control, and recreation.

Environmental Effects: What kinds of environmental impact will the improvement alternatives create? Can negative impacts be mitigated (see Chapter 10, *Miscellaneous Documents*)?

Flexibility: How well can the improvement alternative respond to changes in land use patterns, water demand projections, and resource management decisions? Can it be phased in?

Implementation: How easy will it be for the improvement alternative to be accepted, designed, constructed, and financed?

Life Expectancy: When will the facility need to be replaced?

Risk: What risks are associated with selecting, or not selecting, certain alternatives taking into account health risks, economic risks, and reliability of service risks?

Each potential improvement needs to be assessed, with a discussion included in the WSP. It may be useful to rank the improvement alternatives in order of preference.

C. Selection of Alternatives

Select the preferred set of improvement alternatives from Step B above. Selected improvements should be described in a clear and concise manner. Focus attention on those alternatives directly affecting public health. Improvements which will have limited public health significance do not need extensive discussion. Include a map showing the location and sizing of proposed improvements, where applicable.

Selected improvements from this exercise will be performed within each chapter, then incorporated into the schedule of improvements in the following section.

2. Improvement Schedule

The minimum planning period to be considered in the WSP is 20 years. Updates to the WSP must occur at least once every 6 years. Therefore, a definite annual schedule of improvements must extend at least 6 years into the future to correspond with the 6 year WSP update requirement and capitol facilities planning pursuant to GMA. This schedule must be supported by the financial program. The subsequent 14 year (or longer) period may be more general and flexible in scheduling improvements due to less precise growth and financial data.

The improvement schedule should be based on one or more of the following scheduling considerations:

Identified Deficiencies: System deficiencies, especially those which relate to protection of the health of consumers, should be the top priority when developing the improvement schedule.

Growth: Improvements may be undertaken when the water demand reaches capacity in all or parts of the service area affected by the potential improvement. This type of scheduling can give purveyors the flexibility to undertake projects as improvements are

needed. Typical improvements based upon growth include the development of additional source, increase in storage, or completion of a transmission grid. If growth is used as a scheduling tool, the relationship between projects should be clearly outlined. Priority projects should be ranked in accordance with their dependence upon each other. An estimated year for carrying out a growth-related improvement should be identified.

Fixed Dates: Most utilities use fixed dates to schedule needed improvements. This type of scheduling provides water system managers with knowledge of improvements required for the planning period identified in the WSP. With fixed date scheduling, costs may be easier to predict. Also, a more definite financial program can be established. Typical improvements based on fixed dates include facilities that need to be replaced, facilities that would correct an identified water quality problem, implementation of conservation measures and studies (such as a ground water monitoring program).

Improvements mandated by State Board of Health regulations must be scheduled by this method.

Financial Priority: Improvements that will be implemented only when enough revenue has been generated are based on financial priority. Financial priority scheduling provides water system managers with knowledge of improvements to be implemented as funds become available. Financial priority scheduling should not be used for projects needed to meet health requirements or future water demands.

Milestones: Milestones are useful for tracking the success rate for implementing the improvement schedule. To the extent feasible, milestones should be included regardless of the selected scheduling method.

Ongoing Programs: The schedule should include a prioritization of ongoing programs. In some cases, it may prove beneficial to reduce or eliminate an ongoing program in order to accommodate a needed improvement. Conversely, an improvement project may need to be delayed or modified in order to accommodate a high priority ongoing program.

Availability of Outside Funding: If a selected alternative is contingent upon receiving a grant or loan, alternative funding options or contingency plans should be discussed.

Major Facilities: Major facility improvements should be subjected to a thorough financial evaluation. Major improvements include source development, storage, transmission, and treatment projects. Financial aspects of minor improvements may be examined more briefly.

Critical Facilities: Specific financial arrangements should be indicated for facility improvements needed to satisfactorily operate the water system both from a water quality and reliability standpoint. Facilities needed to bring the water system into compliance with local, state or federal rules are included in this category.

Distribution Facilities: If known distribution projects are identified in the WSP specific financial arrangements can be identified. However, if distribution projects are scheduled on an annual basis, a much more general funding program could be developed. For example, annual funds set aside for making distribution improvements could be identified without specifically identifying each distribution project.

Non-Facilities: Programs and studies relating to crucial utility decisions about operations, water quantity and water quality should be accompanied by specific financial arrangements. This could include, but is not limited to, programs such as ground water protection, watershed control, cross-connection control, conservation, comprehensive rate analysis, and engineering studies related to specific projects.

Timing of Improvements: Facilities scheduled for construction within the first 6 years of the planning period should be more thoroughly evaluated than facilities scheduled for later construction. Since capital improvement programs are usually updated on a yearly basis, thorough financial information should be available for immediate projects.

Location of Improvements: Improvements that will be constructed within the system's service area should receive more thorough financial evaluation than projects outside of the service area. Development of financial arrangements for joint-use projects may require complex negotiations between several entities. Detailed documentation of financial arrangements is not expected in the WSP. Also, GMA requirements regarding identifying infrastructure needs, and policies concerning urban and rural development and water utility level of service standards should be taken into account when developing the financial program.

Municipal systems needing extensive improvements and possessing a variety of potential funding sources may have a high degree of uncertainty regarding levels of funding at any given time. For these systems, the following may be an option. List all known projects and actions which have a definite time schedule. Provide information about how decisions will be made on future projects. Identify how and when the improvement schedule will be updated to reflect new projects as their funding sources and schedules are established.

The improvement schedule should appear as a chart in the WSP (see Table 5 *Improvement Schedule*). Any phasing of improvements should be clearly identified on the chart. Cost figures associated with each improvement identified in the *Identification of Improvements* section should be shown on the chart. These cost figures will aid in developing the financial program. If the necessary financing cannot be arranged, the improvement schedule must be modified to maintain the viability of the WSP.

Note: If the improvement schedule is modified, the preferred alternatives identified in the previous chapters must be changed accordingly.

Table 5
Improvement Schedule

Project Title	Type of Improvement	Description	Page Where Need Identified	Cost Estimate	Financing Source	Year

Note: The Table should cover at least 6 years.

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Chapter 9

Financial Program

Objective

The objective of the financial program is to identify the total cost of providing water service, assure that the utility improvement schedule will be implemented, and assist in establishing adequate fees for service. Statutory authority for financial program is derived from Chapters 43.20, 70.116 and 70.119A RCW. Regulatory authorities include Chapters 246-293 and 246-294 WAC, plus WAC 246-290-100.

Plan Content

Financial planning is one of the most important aspects of the WSP. A comprehensive financial program must be established to successfully implement the WSP. Operational maintenance, and major improvement costs should be identified, along with a complete funding program that clearly indicates that the utility will be financially viable for the planning period. In order to develop a complete financial assessment, the **total cost** of providing water service must be identified.

In order for a system to be “financially viable,” it must have the capacity to obtain sufficient funds to develop, construct, operate, maintain and manage a public water system on a continuing basis in full compliance with federal, state and local requirements. By establishing a sound financial program, the utility’s decision makers will be assured that the improvement schedule can be implemented. Thus, a good financial program can make the difference between a “wish list” and a useful and implementable plan. In addition, a complete financial program can assist the purveyor in establishing water rates and other charges that reflect the actual cost of providing service.

Financial planning is a complex subject. It is often difficult for a purveyor to determine the appropriate level of detail needed in the WSP. All WSPs must include a general financial framework that addresses the utility's **overall** financial situation. Detailed financial arrangements, such as lending institution requirements or specific rate design information need not be included in the plan. The financial program should be coordinated with the improvement program.

Financial program requirements are divided into three categories based on the size and ownership of the water system. Categories #1 and #2 exclude investor owned utilities (IOUs) regulated by the State Utilities and Transportation Commission (UTC). Regulated systems include those IOUs that have 100 or more service connections or whose annual rate exceeds an identified threshold. The three categories are:

1. Water Systems With 1,000 or More Connections (Not Regulated by UTC);
2. Water Systems With Less Than 1,000 Connections (Not Regulated by UTC); and
3. Water Systems Regulated by UTC.

1. Water Systems With 1,000 or More Connections (Not Regulated by UTC)

The emphasis of the financial program for systems with 1,000 or more connections is on the improvement program. Due to available funding sources and a large rate base, a thorough assessment of the total cost of providing service is recommended, but not required.

However, a general discussion of all costs is required. The WSP for these systems should include the following information:

Past and Present Financial Status

A clear and concise description of the past and present financial status of the utility should be presented. This should include:

- A summary of operating income and expenses for the past 6 years;
- A current budget; and
- The utility's past and current plan for financing major improvements.

When identifying the past and present status of the utility, list annual water rate revenue, general facility charge revenue, local improvement district assessment revenue, and any other utility income under operating income. For operating expenses, itemize annual water system indebtedness, (bank loans, bond repayments, etc.), operating and maintenance expenses, facility replacement funds, and appropriations for major improvements. An example utility budget has been included in DOH's *Financial Viability Manual*.

Available Revenue Sources

List anticipated revenue sources for making system improvements including: funds generated from investment and existing sources such as water sales, assessments, general facilities charges (service installation fees, etc.), general obligation bonds, revenue bonds, assessment income, grant funds (state and federal) and developer extension fees.

Allocation of Revenue Sources

The allocation of revenue sources is one of the key mechanisms for implementing the WSP. A program allocating funds to finance each major improvement scheduled in the improvement program (Chapter 8) can be developed from information on revenue sources and the cost of each recommended improvement. For example, revenue generated from developer extension fees and general facilities charges could be designated for growth related improvements. Allocation of revenue source should appear on a chart similar to Table 5, *Improvement Schedule* (Chapter 8).

Program Justification

To develop a realistic financial program to fund improvements and ongoing operation and maintenance costs, the system's projected revenue requirements and its ability to secure these funds should be included. Any assumptions regarding inflation rate, interest rates, bonding limit and grant eligibility should be clearly stated.

Assessment of Rates

The WSP should provide the water system's current rate structure and a brief discussion of potential changes in the rate structure. For example, if revenue bonds will be sold, estimate the accompanying increase in water rates. The WSP should evaluate the impact of increasing water rates on water demand and, ultimately, the need for certain improvements.

The assessment of rates must include an analysis of rate structures that promote conservation. If a conservation rate structure will not be used, clear documentation as to why such rates were not utilized must be identified. The WSP should also include a statement that rates are adequate or will need to be increased to successfully implement the WSP. For the initial 6 year planning period, any known percentage increase in rates should be identified in a rate study. The rate study should provide the basis for proposed rates and this study should be included in the improvement schedule.

If the funds needed for scheduled improvements cannot be generated, the improvement elements identified in the previous chapters and contained in the improvement program must be reexamined for possible modification, delay or elimination.

2. Water Systems With Less Than 1,000 Connections (Not Regulated by UTC)

Funding sources and the ability to generate capital through rates are limited for systems with less than 1,000 service connections. Therefore, financial programs of these systems should provide details of the total cost of providing service. The WSP for these systems should address information concerning past financial status, improvement program financing, and rate structure. In addition, water systems in this category are required to take a Financial Viability Test (reference DOH's *Financial Viability Manual*). The following summary will assist purveyors in understanding their financial program requirements:

Past Financial Status

The utility should provide a summary of the utility's past financial status. This summary should include an itemized summary of system revenue and expenses (i.e., income and balance sheets) for the past 6 years, a current budget and a discussion of how system improvements have been financed historically.

Improvement Program Financing

Identify a specific funding source for each improvement listed in the improvement program.

Financial Viability Test

The purpose of the financial viability test, (FVT), is to ensure that the water system meets all regulatory and prudent business practices. The FVT is a way to demonstrate to utility owners and managers, utility customers, and DOH that the total cost of providing service has been taken into consideration. The financial viability test consists of four related tests. The first three tests are to determine if the utility has an adequate 6 year Operating Budget, Operating Cash Reserve, and Emergency Reserve. The fourth test, the household

income index, allows DOH and the purveyor to evaluate the local impact of utility operation and capital funding requirements. Each test is explained in detail in DOH's *Financial Viability Manual*.

Rate Structure Analysis

The WSP should include the current rate structure used by the utility. The WSP should also address contemplated changes to the current rate structure over the next 6 years. **Any rate analysis must include consideration of rate structures that promote conservation. If the utility will not use a conservation rate structure, then clear documentation must be identified.**

3. Water Systems Regulated by UTC

Both UTC and DOH are responsible for evaluating the financial program of regulated investor owned utilities.

UTC will help DOH determine if the water system is financially viable and financially feasible. **Financial viability** is the ability of an IOU to obtain sufficient funds, on a continuous basis, to cover the total cost of developing, constructing, operating, and maintaining a company in compliance with federal, state, and local requirements. **Financial feasibility** reflects a company's ability to provide a sufficient quantity and quality of water service for the planning period (6 years).

The following elements should be addressed in the financial program for an IOU regulated by UTC:

Historical Financial Information

Include a summary of the past financial status of the company that contains income and balance sheets for the last 6 years of operation and a discussion on how system improvements have been financed historically.

Future Financial Planning Information

Future financial planning information should be divided into four parts:

- Projected cost of operation and maintenance activities for the six year planning period;
- Projected costs of improvements identified in the Improvement Program (Chapter 8);
- Proposed financial mechanisms (i.e., borrowed money, owner or other party invested capital) for each capital and non-capital improvement listed in the Improvement Program; and
- Anticipated revenue from existing and proposed rates and related changes which includes an impact analysis of any proposed rate increases. This assessment must include an analysis of using rate structures that promote conservation. If conservation rate structures will not be used, the WSP must contain clear documentation as to why such rates were not utilized. The current rate schedule

must also be included in the WSP. An example budget has been included in DOH's *Financial Viability Manual*.

To determine the viability and feasibility of a regulated IOU, UTC and DOH have developed a three part test that includes:

1. Positive Annual Income;
2. Positive Retained Earnings; and
3. Capital/Asset Ratio.

Additional information regarding the content of investor owned utilities financial programs' is included in the DOH document *Required Content of Financial Program for IOU's Regulated by UTC*.

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Chapter 10

Miscellaneous Documents

Objective

The objective of this chapter is to provide documentation on WSP compliance with the requirements of the State Environmental Policy Act (Chapter 43.21 RCW), present other supportive documents, such as standard construction specifications, and to identify the full text of key agreements related to the WSP.

Plan Content

This chapter should include the following two categories:

1. Supportive Documents, and
2. Agreements.

1. Supportive Documents

State Environmental Policy Act

Consideration of the State Environmental Policy Act (SEPA) is mandatory for water systems with 1,000 or greater service connections. A determination must be made at the start of the planning process regarding designation of the "lead agency" responsible for meeting SEPA requirements. If the water system is a municipality, then the utility may act as lead agency. If the system is non-municipally owned, a local government agency will generally act as lead agency and be responsible for SEPA requirements.

The SEPA checklist must be included as part of the WSP. The WSP must also include a Determination of Non-Significance (DNS), a mitigated DNS or a Final Environmental Impact Statement (EIS). All projects required to eliminate or mitigate environmental impacts noted in the SEPA checklist or EIS must be included in Chapter 8, *Improvement Program*, and Chapter 9, *Financial Program* of the WSP, if appropriate.

Lead agencies are responsible for complying with SEPA and issuing the DNS, mitigated DNS or Final EIS. To accomplish this requirement, these entities have their own SEPA procedures and regulations. The WSP should refer to these procedures for specific directions in complying with SEPA.

Other Supportive Documents

The WSP should include any relevant supportive documents as appendices. Examples of such documents include standard construction specifications (see Chapter 7, *Distribution Facilities Design and Construction Standards*) and resolutions adopting the WSP, if applicable.

2. Agreements

The entire text of agreements referred to in previous chapters of the WSP should be included in the appendix. Key agreements might include:

Service Area Agreements : delineating each utility's future service area.

Intertie Agreements : defining system intertie use and reimbursement conditions.

Source Agreements : outlining conditions for obtaining or wholesaling water supply from or to other entities. Such items as terms of service, reimbursements, guarantees, and contract duration should be defined.

Wheeling Agreements : designating conditions and rates for use of another utility's pipelines for transmitting water.

Joint Use Agreements : defining conditions for sharing construction, maintenance facilities and/or water from storage reservoirs with other utilities.

Cooperation Agreements : outlining agreements with counties, cities or other entities dealing with a variety of subjects ranging from mutually beneficial studies to subdivision review procedures.

Mutual Aid Agreements : defining conditions between utilities for standby emergency use of water and equipment (may be similar to intertie agreements).

In addition, any proposed key agreements that will soon be consummated should be included as an appendix. Other types of agreements, such as developer agreements and fire hydrant service agreements, may not be necessary as an appendix, but should be discussed in the text of the WSP. Agreements that need to be developed and/or implemented within the next 6 years should be listed in Chapter 8, *Improvement Program*.

Appendix I

Information Sources

Information is available from all of the following agencies and organizations. You can obtain the current list of DOH Division of Drinking Water publications and recommended references from any of our Drinking Water Offices or phone, toll free, 1-800-521-0323. You can also obtain information through the DOH home page on the Internet. Our address is <http://www.doh.wa.gov/ehp1/dw>.

Agencies

Washington State Department of Health Contacts:

Headquarters

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Washington State Department of Community, Trade & Economic Development**Planning**

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Funding

Public Works Trust Fund Division
PO Box 48300
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Washington State Utilities and Transportation Commission

P O Box 47250
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(360) 753-6423

US Environmental Protection Agency, Region 10

1200 Sixth Avenue
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(206) 553-4092

Other :**American Public Works Association**

Washington State Chapter
4306 SW Admiral Court
Portland, Oregon 97221
Phone: (503) 246-5036

American Water Works Association Bookstore

6666 West Quincy Avenue
Denver, Colorado 80235
Phone: (800) 926-7337

Association of Washington Cities

1076 South Franklin Street
Olympia, Washington 98501
(360) 753-4137

Investor Owned Utility Association

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Gig Harbor, Washington 98335
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Washington Public Utility District Association

1111 Third Avenue Suite 1870
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Washington State Association of Counties

206 - 10th Avenue SE
Olympia, Washington 98501-1311
(360) 753-1886

Washington State Water and Wastewater Association

19863 28th Avenue South
Seattle, Washington 98188
Phone: (206) 878-5211

Appendix II

Plan Content Checklist

The following checklist summarizes the topics which are discussed in each section of this handbook. It is intended to serve as a checklist for the purveyor, assuring that key topics are included in the draft WSP. DOH will use this checklist during the plan review process.

<i>Water System Planning Handbook Chapter</i>	WSP Chapter (If Applicable)	WSP Page (If Applicable)
Chapter 1 - Description of Water System		
Ownership and Management	_____	_____
System Name	_____	_____
Type of Ownership	_____	_____
Management Structure	_____	_____
Water Facilities Inventory Report Form	_____	_____
System Background	_____	_____
History of Water System Development and Growth	_____	_____
Geography	_____	_____
Neighboring/Adjacent Purveyors	_____	_____
Ordinances/By Laws	_____	_____
Inventory of Existing Facilities	_____	_____
Description of Facilities and Major Components	_____	_____
Number of Service Connections (Existing and Approved)	_____	_____
Existing Interties	_____	_____
Related Plans	_____	_____
List of Related Plans	_____	_____
Comments From Agencies and Adjacent Purveyors	_____	_____
Responses to Comments	_____	_____
Existing Service Area and Characteristics	_____	_____
Existing Service Area Map	_____	_____
Zoning and Land Use	_____	_____
Future Service Area	_____	_____
Future Service Area Map	_____	_____
Zoning and Land Use	_____	_____
Service Area Agreements	_____	_____
Service Area Policies	_____	_____
Satellite Management	_____	_____
Condition of Service Policies	_____	_____

Chapter 1 - Description of Water System (Cont.)	WSP Chapter (If Applicable)	WSP Page (If Applicable)
Complaints	_____	_____
Policy	_____	_____
Recordkeeping	_____	_____
Chapter 2 - Basic Planning, Data and Water Demand Forecasting		
Current Population, Service Connections, Water Use, and Equivalent Residential Units	_____	_____
Current Population	_____	_____
Total Service Connections	_____	_____
Water Use Data Collection	_____	_____
Equivalent Residential Units	_____	_____
Projected Land Use, Future Population, and Water Demand	_____	_____
Projected Land Use	_____	_____
Projected Population	_____	_____
Projected Non-Residential Water Needs	_____	_____
Projected Non-Revenue Water	_____	_____
Water Rates and Rate Impacts on Water Demand	_____	_____
Water Demand Forecasting	_____	_____
Chapter 3 - System Analysis		
System Design Standards	_____	_____
Water Quality Analysis	_____	_____
Historical Review of Trends	_____	_____
Future Requirements	_____	_____
System Description and Analysis	_____	_____
Source	_____	_____
Water Treatment	_____	_____
Storage	_____	_____
Distribution System/Hydraulic Analysis	_____	_____
Identification of System Improvements	_____	_____
Assessment of Alternatives	_____	_____
Prioritizing Improvements	_____	_____
Selection of Alternatives	_____	_____
Chapter 4 - Conservation Program, Water Right Analysis, System Reliability and Interties		
Conservation Program Development and Implementation	_____	_____

Required Measures For All Systems	_____	_____
Chapter 4 - Conservation Program, Water Right Analysis, System Reliability and Interties - (Cont.)	WSP Chapter (If Applicable)	WSP Page (If Applicable)
Other Measures and Level of Implementation	_____	_____
Conservation Program Outline	_____	_____
Regional Conservation Programs	_____	_____
Source of Supply Analysis	_____	_____
Enhanced Conservation Measures	_____	_____
Water Right Changes	_____	_____
Interties	_____	_____
Artificial Recharge	_____	_____
Use of Reclaimed Water, Reuse, and other Non-potable . . . Sources	_____	_____
Treatment	_____	_____
Water Right Evaluation	_____	_____
Permits, Certificates, Claims and Applications - Narrative .	_____	_____
Existing Water Right(s) Status (Table 3)	_____	_____
Forecasted Water Right(s) Status (Table 4)	_____	_____
Water Rights, Current Water Usage and Projected Needs . .	_____	_____
Water Reservations	_____	_____
Assessment of Need for Additional Water Rights	_____	_____
Water Supply Reliability Analysis	_____	_____
Summary of System Reliability Efforts	_____	_____
Water Shortage Response Planning	_____	_____
Monitoring Well Levels	_____	_____
Interties	_____	_____
Existing Interties	_____	_____
New Intertie Proposals	_____	_____
Intertie Agreements	_____	_____
Identification of System Improvements	_____	_____
Assessment of Alternatives	_____	_____
Prioritizing Improvements	_____	_____
Selection of Alternatives	_____	_____
Chapter 5 - Source Water Protection		
Wellhead Protection Program	_____	_____
Overview	_____	_____
Completed Susceptibility Assessment Form(s)	_____	_____

Wellhead Protection Area Information	_____	_____
Chapter 5 - Source Water Protection (Cont.)	WSP Chapter	WSP Page
	(If Applicable)	(If Applicable)
Delineation of Wellhead Protection Area(s)	_____	_____
Contaminant Source Inventory	_____	_____
Notification of Findings	_____	_____
Contingency Plan	_____	_____
Spill Response Plan	_____	_____
Regional Implementation Efforts	_____	_____
Implementation Strategies	_____	_____
Watershed Control Program	_____	_____
Watershed Description/Characteristics	_____	_____
Identification of Activities/Land Uses Detrimental to Water Quality	_____	_____
Watershed Management and Control Measures	_____	_____
Monitoring Program	_____	_____
System Operations	_____	_____
Periodic Watershed Evaluations/Updates	_____	_____
Identification of System Improvements	_____	_____
Assessment of Alternatives	_____	_____
Prioritizing Improvements	_____	_____
Selection of Alternatives	_____	_____
Chapter 6 - Operation and Maintenance Program		
Water System Management and Personnel	_____	_____
Operator Certification	_____	_____
System Operations and Control	_____	_____
Identification of Major System Components	_____	_____
Routine System Operation	_____	_____
Preventative Maintenance Program	_____	_____
Equipment, Supplies and Chemical Listing	_____	_____
Comprehensive Monitoring (Regulatory Compliance) Plan	_____	_____
Monitoring Plan Elements	_____	_____
Source	_____	_____
Distribution	_____	_____
Treatment	_____	_____
Adjustments to Monitoring Programs	_____	_____
Emergency Response Program	_____	_____

Water System Personnel Emergency Call-Up List	_____	_____
Chapter 6 - Operation and Maintenance Program (Cont.)	WSP Chapter	WSP Page
	(If Applicable)	(If Applicable)
Notification Procedures	_____	_____
Vulnerability Analysis	_____	_____
Contingency Operational Plan	_____	_____
Safety Procedures	_____	_____
Cross-Connection Control Program	_____	_____
Customer Complaint Response Program	_____	_____
Recordkeeping and Reporting	_____	_____
O & M Improvements	_____	_____
Identification of System Improvements	_____	_____
Assessment of Alternatives.	_____	_____
Prioritizing Improvements	_____	_____
Selection of Alternatives	_____	_____
Chapter 7 - Distribution Facilities Design and Construction Standards		
Project Review Procedures	_____	_____
Policies and Requirements for Outside Parties	_____	_____
Design Standards (Performance Standards and Sizing Criteria) . .	_____	_____
Construction Standards (Materials and Methods)	_____	_____
Construction Certification and Follow-up Procedures	_____	_____
Identification of System Improvements	_____	_____
Assessment of Alternatives	_____	_____
Prioritizing Improvements	_____	_____
Selection of Alternatives	_____	_____
Chapter 8 - Improvement Program		
Improvement Schedule (Table 5)	_____	_____
Chapter 9 - Financial Program		
Water Systems with 1,000 or More Connections (Not Regulated by UTC).	_____	_____
Past and Present Financial Status	_____	_____
Available Revenue Sources	_____	_____
Allocation of Revenue Sources	_____	_____
Program Justification	_____	_____
Assessment of Rates	_____	_____
Water Systems with Less Than 1,000 Connections (Not Regulated by UTC)	_____	_____

Past Financial Status

Chapter 9 - Financial Program (Cont.)

Improvement Program Financing

Financial Viability Test

Rate Structure Analysis

Water Systems Regulated by UTC

Historical Financial Information

Future Financial Planning Information

Chapter 10 - Miscellaneous Documents

Supportive Documents

State Environmental Policy Act

Other Documents

Agreements

Comments on WSP from County

Comments on WSP from Adjacent Utilities

WSP Chapter
(If Applicable)

WSP Page
(If Applicable)
